THE UNIVERSITY
OF ILLINOIS
LIBRARY
638.06
IL
V.33-34
Cop. 3

AGRICULTURE

SHOUT
SHARE
IT

STATE OF ILLINOIS
HENRY HORNER, Governor

THIRTY-THIRD AND THIRTY-FOURTH ANNUAL REPORTS

OF THE

ILLINOIS STATE BEEKEEPERS' ASSOCIATION

1933-1934

FORTY-FOURTH YEAR OF ASSOCIATION

Organized February 26, 1891, at
Springfield, Illinois

Compiled by
E. F. PETERSON
1325 Pine St.,
Kewanee, Illinois

THE LIBRARY OF THE
JUL 1935
UNIVERSITY OF ILLINOIS

[Printed by authority of the State of Illinois.]

ALLIED PRINTING TRADES UNION LABEL COUNCIL
7
(48117)

635.06
IL
I33-34

LETTER OF TRANSMITTAL.

OFFICE OF THE SECRETARY,
KEWANEE, ILLINOIS, *December 31, 1934.*

To His Excellency, Henry Horner, Governor of the State of Illinois:

SIR: I have the honor to transmit herewith the Thirty-third and Thirty-fourth Annual Reports for the forty-third and forty-fourth years of the Illinois State Beekeepers' Association.

E. F. PETERSON, *Secretary.*

THE LIBRARY OF THE
JUL 8 1935
UNIVERSITY OF ILLINOIS

902814

THIRTY-THIRD AND THIRTY-FOURTH ANNUAL REPORTS

FOR THE FORTY-THIRD AND FORTY-FOURTH YEARS

OF THE

Illinois State Beekeepers' Association

OFFICERS OF ILLINOIS STATE BEEKEEPERS' ASSOCIATION FOR 1933.

C. A. Mackelden - - - - - - - President
Jerseyville.

Edwin Peterson - - - - - - Vice-President
Kewanee.

Louie Vannis - - - - - - - Vice-President
Harrisburg.

Roy Annear - - - - - - - Vice-President
Mulkeytown.

Benj. H. Fischer - - - - - - Vice-President
Roanoke.

A. G. Gill - - - - - - - Vice-President
Chicago.

Elmer Kommer - - - - - - - Treasurer
Woodhull.

E. J. McCormick - - - - - - - Secretary
6810 S. Winchester Avenue, Chicago, Illinois.

OFFICERS OF ILLINOIS STATE BEEKEEPERS' ASSOCIATION FOR 1934.

C. A. MACKELDEN - - - - - - - President
Jerseyville.

H. W. JONES - - - - - - - Vice-President
Cary.

C. L. DUAX - - - - - - - Vice-President
Chicago.

W. S. LOHNES - - - - - - - Vice-President
Pekin.

A. G. GILL - - - - - - - Vice-President
Chicago.

ROY ANNEAR - - - - - - - Vice-President
Mulkeytown.

ELMER KOMMER - - - - - - - Treasurer
Woodhull.

EDWIN PETERSON - - - - - - - Secretary
1325 Pine St., Kewanee.

OFFICERS OF ILLINOIS STATE BEEKEEPERS' ASSOCIATION FOR 1935.

V. G. Milum - - - - - - - - President
Champaign.

W. S. Lohnes - - - - - - - Vice-President
Pekin.

Adam Bodenschatz - - - - - - - Vice-President
Lemont.

H. W. Jones - - - - - - - Vice-President
Cary.

A. G. Gill - - - - - - - Vice-President
Chicago.

Robert Gober - - - - - - - Vice-President
Oregon.

Wesley W. Osborn - - - - - - - Treasurer
Hillsboro.

Edwin F. Peterson - - - - - - - Secretary
1325 Pine St., Kewanee.

MINUTES OF THE FORTY-THIRD ANNUAL CONVENTION OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION, SPRINGFIELD, ILLINOIS, NOVEMBER 15–16, 1933.

The forty-third annual convention of the Illinois State Beekeepers' Association held in the parlors of the St. Nicholas Hotel, Springfield, Illinois, was called to order by the President, Mr. C. A. Mackelden, of Jerseyville.

Edward Heldt was chosen by the Executive committee to act as secretary during the meeting, on account of the sickness and absence of the Secretary, E. J. McCormick. The minutes of the last meeting were read and on motion of Mr. Tyler and Mrs. Kildow, were approved as read.

Mr. C. A. Mackelden, The President, then made the following committee appointments:

1. Auditing—Wesley Osborne, Ross Morrill.
2. Resolutions—J. H. McClure, W. L. Ritter.
3. Banquet—Mr. Force, Bob Mathews.
4. Executive—

The financial reports of the Treasurer and Secretary were read by Elmer Kommer and Acting Secretary Edward Heldt respectively and referred to the Auditing Committee, who at the final business session on November 16 reported them correct, and on motion of Mr. Osborne seconded by Mr. Heldt, the reports were unanimously accepted. These reports showed total receipts of $362.53 and total expenditures of $242.59, leaving a balance on hand for the year beginning November 17, 1932, and ending November 16, 1933 of $119.94 minus a federal check tax on nine checks of 18 cents, leaving a total of $119.76 with an unpaid bill of $100 to the Secretary Mr. E. J. McCormick as salary for six months.

The President then gave an interesting talk on the efforts put forth by the executive committee in getting our reduced appropriation through the General Assembly. We take this opportunity to express our thanks to Mr. Jackson and Mr. Wilson of the Assembly and the Executive Committee for their effective efforts in the Association's behalf.

The Treasurer, Mr. Kommer, then explained to the members of the association how its money was spent and the present disposition of the association's balance.

Postal money order, checks and cash	$ 92.56
Funds tied up in Farmers National Bank	27.20
Total	$119.76

The morning session of November 14 was adjourned at 12:20 p. m., and was called to order for the afternoon session at 1:30 with the President, Mr. Mackelden, Presiding.

A discussion followed on the rules and regulations of honey, and on a motion by Mr. Brice, seconded by Mr. Harry Bryant, the President appointed the following committee: Mr. Bell, Mr. Smith and Mr. Mathews, to get a ruling from the right authority of the State and report it to the Secretary to print it in the next report.

The next topic under discussion was the placing of honey in the World's Fair next year. Three ways were brought out:

1. Buy a concession, e. g. Straub Laboratories (right to sell honey.)
2. As a Scientific display, e. g. display by A. I. Root Co.
3. As a Hall of States product, e. g. Florida.

Three association members of Chicago, Mr. Duax, Mr. Gill and Mr. Woolridge, were appointed as a committee to get honey in the Chicago World's Fair. Laurence Peterson of Kewanee, Adam Bodenschatz of Lamont, and Hoyt Taylor of Pleasant Plains were named as a committee to make recommendations for exhibits at the State Fair for next year.

Three ex-secretaries Mr. G. H. Cale, Mr. M. G. Dadant, and Mr. V. G. Milum were called upon.

Mr. G. H. Cale gave a very interesting talk on Mass Production of Honey, covering the cost of production, short cuts in production, package bees versus wintered bees, central plant and out apiaries, and the use of chemicals in beekeeping.

A telegram from Mr. Jackson announced his inability to attend the convention.

Mr. M. G. Dadant gave us an entertaining and instructive view of the highlights of beekeeping from the past to the present.

Mr. Milum briefly extolled the virtues of the American Honey Institute, showing that like all other businesses, advertising and research are essential fundamentals to the success of that business. Mr. C. L. Duax made an interesting talk on Advertising and we hope to have it listed in the report for the year.

The Chief Inspector, A. L. Kildow, then gave his report, which was duly accepted by the association.

Dr. Stewart, member of the House, also gave a brief talk in which he promised full co-operation with the association in its needs.

The meeting was then adjourned until 9:00 o'clock Thursday morning. The annual banquet of the association was held in the hotel parlors at 6:30 p. m., November 15, with eighty in attendance, and Mr. Edwin Peterson as Toastmaster. Mr. M. G. Dadant, Mr. C. L. Duax, Senator Cross, Mr. McLaughlin, Mr. G. H. Cale, Mr. Lloyd, Mr. Milum, Mr. Kenneth Hawkins and Miss Brooks responded with brief addresses when presented by the toastmaster. After the banquet Mr. Duax gave an excellent number of imitations and Miss Brooks gave an interesting evening in a review of Green Pastures.

President C. A. Mackelden called the last meeting to order on November 16 at 9:30 a. m. The Auditing Committee made its report. This was followed by the reading of the resolutions as drawn up by the Rosolutions Committee. A report of the resolutions are attached,

which were passed as read. J. R. Woolridge was made an honorary member.

Mr. Kommer made a motion, duly seconded, that the Secretary's salary be reduced to $100 for the next year. In the discussion Mr. Osborne made an amendment to the motion that the salary be lowered to $150 per year. This amendment was seconded and passed. The amended motion was then passed. The election of officers was then held:

President—C. A. Mackelden, Jerseyville.
Vice-President—A. G. Gill, Chicago.
Second Vice-President—W. S. Lohnes, Pekin.
Third Vice-President—Roy Annear, Mulkeytown.
Fourth Vice-President—H. W. Jones, Cary.
Fifth Vice-President—C. L. Duax, Chicago.
Treasurer—Elmer Kommer.
Secretary—Edwin Peterson.

Mrs. Duax, Mrs. Simmer of Chicago and Mrs. King of Springfield were appointed by the President to make recommendations concerning the exhibit of honey cooking in the culinary department of the State Fair.

A question was raised by A. L. Kildow as to how long an amateur stayed an amateur. After discussion, the question was referred to the Fair Committee headed by Mr. Peterson with power to act.

The meeting was adjourned at 12:45 p. m., November 16, 1933.

RESOLUTIONS APPROVED AND ADOPTED AT THE FORTY-THIRD ANNUAL CONVENTION HELD NOVEMBER 15–16, 1933.

Be It Resolved, That the Illinois State Beekeepers' Association in its forty-third annual convention assembled at Springfield, Illinois, on November 15th and 16th, 1933, hereby adopt the following resolutions—
Be it further resolved That a copy of same be spread upon the minutes and copies sent to various parties concerned—

1. *Be it resolved* That a vote of thanks be extended to the State Agricultural Department, especially that State Fair Division, and to all individuals contributing to the success of the exhibit at the State Fair.

2. *Be it resolved* That a vote of thanks be extended to the management of the St. Nicholas Hotel for continued courtesies toward our association.

3. *Be it resolved* That a very sincere vote of thanks be extended to the executive committee, individuals, and legislators who sacrificed time, effort and their own personal money to obtain our appropriations.

4. *Be it resolved* That we recognize our loss in those members who have taken their departures since our last meeting, and extend our sincere sympathies toward their families, also extend our sympathies to the members who have left sickness and distress in their homes to serve our association in any way at this convention.

5. *Be it resolved* That the association hereby express its appreciation of Mr. and Mrs. Kildow for their many services as chief inspector and many other services toward the association.

6. *Be it further resolved,* That a copy of these resolutions be placed before Governor Hon. Henry Horner thanking him for all favors toward the association.

7. *Be it finally resolved* That a vote of thanks be extended to all giving services, money, honey, or time to the interest of American Honey Institute.

(These resolutions read at business meeting November 16, 1933, by Mr. McClure, who moved their adoption, which motion was carried.)

Signed J. H. McCLURE,
W. L. RITTER,
Resolutions Committee.

REPORT OF THE TREASURER FOR 1933.

WOODHULL, ILLINOIS, *November 15, 1933.*

To the Illinois State Beekeepers' Association—Greetings:

I have the honor of making my eighth annual report as Treasurer of the Illinois State Beekeepers' Association, subject to your approval:

RECEIPTS.

No.		
(1)	Dec. 1, 1932—Rec'd. from E. J. McCormick, Secy. Dues.....	$32.00
(2)	Feb. 3, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	12.00
(3)	Mar. 8, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	11.00
(4)	Apr. 4, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	23.50
(5)	May 10, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	18.75
(6)	July 8, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	21.50
(7)	July 28, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	10.00
(8)	Sept. 2, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	13.50
(9)	Sept. 26, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	20.50
(10)	Oct. 23, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	17.00
(11)	Nov. 9, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	12.50
(12)	Nov. 13, 1933—Rec'd. from E. J. McCormick, Secy. Dues.....	28.00
	Total dues for year.....	$220.25
	Balance from last convention.....	142.28
	Grand total	$362.53

EXPENDITURES.

Voucher No.		
(1)	V. G. Milum—Expenses to annual convention, etc. (Dec. 28, 1933)	$23.14
(2)	Dec. 3, 1932—Expenses to annual convention, C. A. Mackelden	11.50
(3)	Dec. 3, 1932—Expenses to annual convention, Elmer Kommer	18.89
(4)	Dec. 13, 1932—Express on supplies to E. J. McCormick.....	5.47
(5)	Feb. 8, 1933—Stamps and express—E. J. McCormick.....	50.00
(6)	Mar. 25, 1933—Expense of Executive Committee on Mar. 15..	50.00
(7)	June 1, 1933—Salary of Sec'y. E. J. McCormick.....	50.00
(8)	June 1, 1933—Expense to Springfield, C. A. Mackelden.....	6.70
(9)	June 3, 1933—Expense to Springfield, Elmer Kommer.....	16.76
(10)	Aug. 8, 1933—Salary of Sec'y. E. J. McCormick.....	50.00
	Tax on nine (9) checks at bank.....	.18
	Total expenditure	$242.77

RECAPITULATION.

Receipts during year and last balance.....	$362.53
Total expenditures on vouchers 1 to 10.....	242.77
Balance on hand.....	$119.76

MR. ELMER KOMMER, WOODHULL, ILLINOIS.
Treasurer of Illinois State Beekeepers' Association.
(1926–1934)

I have the funds in my possession as follows:

Funds tied up in Farmers' National Bank, Cambridge	$27.20
Postal money orders, checks and cash	92.56
Total	$119.76

By my report you will see that we have some more funds tied up in another bank that has gone into the hands of the receivers.

If our funds deposited in same bank cannot be placed in the preferred class, then our total to do business with will have to start with $92.56 as per my cash and postoffice orders on hand today.

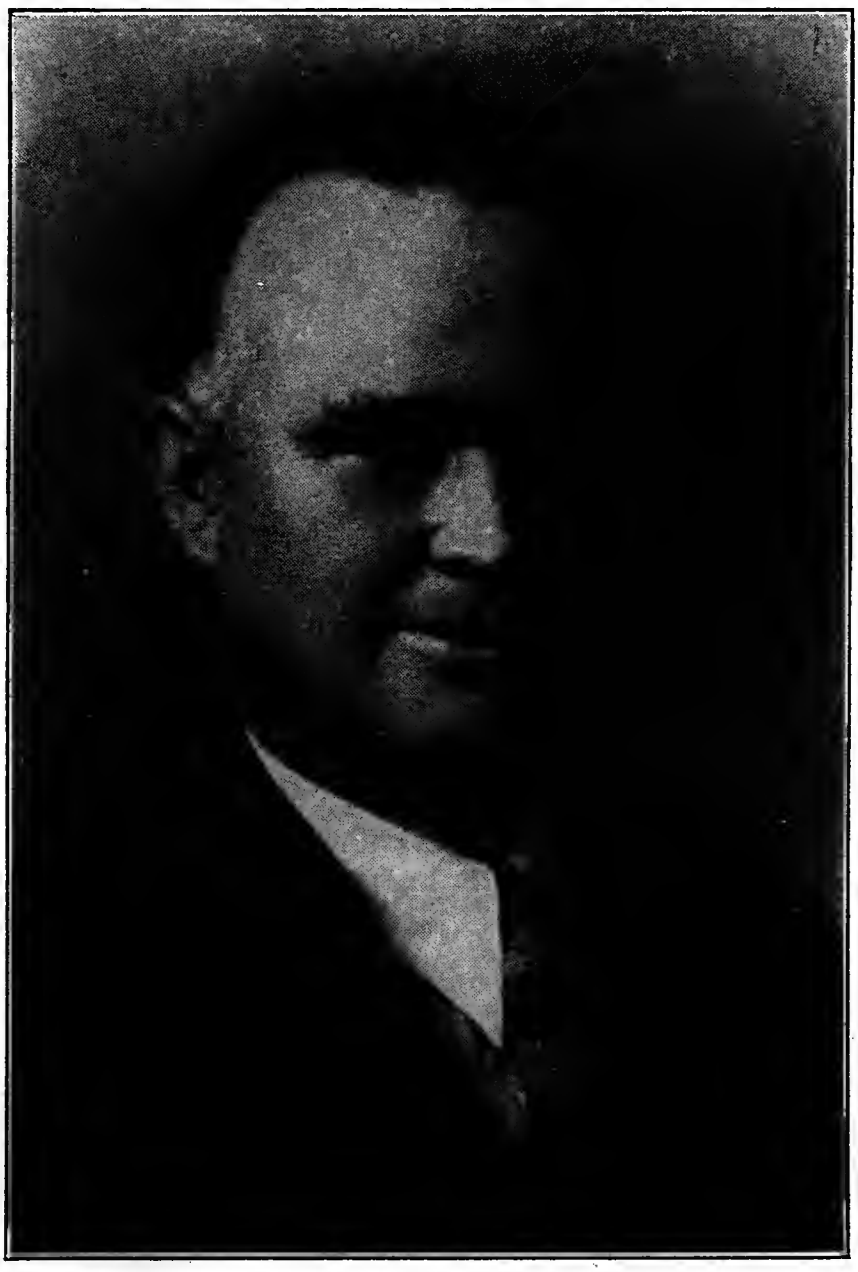
Our receipts during the year have fallen off, as we have actually taken in $210.50 as compared with $266.78 last year for dues; we will have to either get busy and increase our membership or cut down on expenses if we are going to exist as an association.

The Executive Committee expenses have been a little larger this year than usual, due to the necessity of the Executive Committee being compelled to come to Springfield to explain the necessity of the appropriation for the State Association in order to be able to issue our annual report, as well as receive funds to hold our annual convention. Had not these trips been made, I feel like we would have been without any report this year, and possibly not being able to have held this convention, while we did not get the usual $2,400.00 appropriation, yet we did receive $1,500.00 and which was better than losing it entirely. What we must do is to try to get our appropriation back to our former figure so we can get our report issued annually.

ELMER KOMMER,
Treasurer of Illinois State Beekeepers' Association.

We, the Auditing Committee, have examined these records and find them to be correct.

(Signed) WESLEY W. OSBORNE,
ROSS R. MORRILL,
Auditing Committee.



(Theatrical Studio).

MR. E. J. McCORMICK.
Secretary of the Illinois Beekeepers' Association for 1933,
6810 S. Winchester Ave., Chicago, Ill.

FINANCIAL REPORT OF THE SECRETARY FOR PERIOD BEGINNING NOVEMBER 17, 1932 AND ENDING NOVEMBER 15, 1933.

RECEIPTS.

Balance in treasury at last convention, November 17, 1932..... $142.28

Received by Secretary and transmitted to Treasurer or received by Treasurer direct according to the following Membership Dues Receipt Numbers:

Receipt number.	Date received by treasurer.	Description.	Amount received by secretary.	Remitted for Bee Journal.	Remitted to treasurer.
No. 1	Dec. 21	McLean County Assn	$ 3.00		
		Henry County Assn	4.00		
		Warren County Assn	7.00		
		McHenry County Assn	1.00		
		Morgan-Scott County Assn	.50		
		Cook-DuPage County Assn	.50		
		Members at large	16.00	$2.40	
			$32.00	$2.40	$32.00
No. 2	Feb. 5	Cook-DuPage County Assn	2.50		
		Morgan-Scott County Assn	1.00		
		Champaign County Assn	1.50		
		Stark County Assn	2.50		
		JoDaviess County Assn	1.50		
		Members at large	3.00		
			$12.00		12.00
No. 3	Mar. 9	Cook-DuPage County Assn	4.50		
		Piatt County Assn	3.00		
		Will County Assn	.50		
		Ogle-Lee County Assn	.50		
		Champaign County Assn	.50		
		McLean County Assn	1.00		
		Members at large	1.00	$1.00	
			$11.00	$1.00	11.00
No. 4	Apr. 6	Cook-DuPage County Assn	4.00		
		McHenry-Lake County Assn	3.00		
		DeKalb-Kane County Assn	3.50		
		St. Clair County Assn	8.50		
		Peoria County Assn	4.50		
			$23.50		23.50
No. 5	May 12	St. Clair County Assn	4.50		
		Saline and Gallatin County Assn	3.50		
		Cook-DuPage County Assn	.50		
		Champaign County Assn	.50		
		Returning postage money loaned from Association funds, voucher No. 5	9.75		18.75
No. 6	July 10	Jackson County Assn	$ 1.00		
		Lake County Assn	1.50		
		Peoria County Assn	.50		
		Rock Island County Assn	10.50		
		Saline and Gallatin County Assn	.50	$0.50	
		Tazewell County Assn	7.50		
			$21.50	$0.50	21.50

Receipt number.	Date received by treasurer.	Description.	Amount received by secretary.	Remitted for Bee Journal.	Remitted to treasurer.
No. 7	July 29	Cook-DuPage County Assn	$5.00		
		Saline and Gallatin County Assn	3.00		
		Members at large	2.00		
			$10.00		$10.00
No. 8	Sept. 5	Cook-DuPage County Assn	8.00		
		St. Clair County Assn	3.00		
		DeKalb-Kane County Assn	2.00		
		Jersey County Assn	.50		
			$13.50		13.50
No. 9	Sept. 26	Cook-DuPage County Assn	2.50		
		Jersey County Assn	1.50		
		Woodford County Assn	3.50		
		Henry County Assn	5.00		
		Champaign County Assn	1.00		
		Tri-County Assn	7.00		
			$20.50		20.50
No. 10	Oct. 24	Cook-DuPage County Assn	.50		
		Winnebago County Assn	10.00		
		Shelby County Assn	3.50		
		Henry County Assn	1.00		
		Members at large	2.00		
			$17.00		17.00
No. 11	Nov. 9	Cook-DuPage County Assn	.50		
		JoDaviess County Assn	2.50		
		DeKalb-Kane County Assn	1.00		
		Henry County Assn	6.50		
		Members at large	2.00		
			$12.50		12.50
No. 12	Nov. 11	Montgomery County Assn	7.00		
		Rock Island County Assn	16.00		
		Will County Assn	5.00		
			$28.00		28.00
			$220.25	$3.90	$220.25

Total received by Secretary $224.15
Remitted by Secretary for Bee Journals 3.90

Total remitted to Treasurer $220.25
Balance on hand November 15, 1932 ..... 142.28

Total receipts for year ending November 16, 1933 ..... $362.53

EXPENDITURES.

From November 17, 1932 to November 15, 1933 by vouchers as follows:

No. 1—November 28, 1932—V. G. Milum, expenses for 1932 annual convention and banquet ticket $23.14

No. 2—December 3, 1932—C. A. Mackelden, expenses to 1932 annual convention 11.50

No. 3—November 18, 1932—Elmer Kommer, expenses to 1932 annual convention 18.89

No. 4—December 13, 1932—E. J. McCormick, express payment on association equipment shipped to new secretary 5.47

No. 5—February 8, 1933—E. J. McCormick, money borrowed for association postage and express 10.13

No. 6—Executive Committee meeting held in Springfield, March 15, 1933:

C. A. Mackelden	$12.00	
E. J. McCormick	18.00	
Elmer Kommer	20.00	
		50.00

No. 7—June 1, 1933—E. J. McCormick, three months salary.....	50.00
No. 8—July 12, 1933—C. A. Mackelden, expenses to Springfield relative to appropriation.....	6.70
No. 9—September 11, 1933—Elmer Kommer, expenses to Springfield relative to appropriation.....	16.76
No. 10—August 11, 1933—E. J. McCormick, three months salary.....	50.00
Total expenditures	$242.59

RECAPITULATION.

Total receipts, November 17, 1932 to November 15, 1933.....	$362.53
Total expenditures, November 17, 1932 to November 15, 1933.....	242.59
Balance on hand November 15, 1933.....	$119.94
Tax on nine checks at 2 cents.....	.18
	$119.76

Total bills unpaid:

E. J. McCormick, six months salary..... $100.00

We, the Auditing Committee, have examined these records and find them correct.

WESLEY W. OSBORNE,
ROSS R. MORRILL,
Auditing Committee.

1933—REGISTERED ATTENDANCE AT THE FORTY-THIRD CONVENTION, SPRINGFIELD, ILLINOIS.

Name.	Address.	County.	Number of colonies.	Comb or extracted.
Lawrence Peterson	Kewanee	Henry	250	Both.
Archie V. Utt	Oak Lawn	Cook	30	Both.
A. G. Gill	Chicago	Cook	1	
Mrs. Hoyt Raylor	Pleasant Plains	Sangamon		
Mrs. Irene Duax	Chicago	Cook		
Maude Mackelden	Jerseyville	Jersey		
M. G. Dadant	Hamilton	Hancock	400	Extracted.
W. W. Koritz	Buckley	Iroquois		Comb.
Mrs. Helen Lohnes	Pekin	Tazewell		
Mrs. S. A. Tyler	San Jose	Logan		
Mrs. B. F. Bell	Kingston Mines	Peoria		
Laurence W. Fisher	Woodsen	Morgan-Scott		
Helen Rea	Murrayville			
Walter Scott Lohnes	Pekin	Tazewell	25	Comb.
Mrs. W. S. Lohnes	Pekin	Tazewell	1	Comb.
C. J. Anderson	Morris	Grundy	160	Extracted.
Elmer Kommer	Woodhull	Henry	75	Both.
Ed. Heldt	Bloomington	McLean	125	Both.
C. A. Mackelden	Jerseyville	Jersey		
Hoyt Taylor	Pleasant Plains	Sangamon	20	Both.
Albert Davis	Kewanee	Henry		
W. T. Moffett	Athens	Menard	70	Comb.
B. L. Maricle	Brighton	Macoupin	8	Both.
W. H. Force	Champaign	Champaign		Both.
C. P. Jankowski	Gurnee	Lake	50	Extracted.
J. H. McClure	Manchester	Morgan	62	Extracted.
Joe Burdzilauskas	Pana	Christian		
Joe Burdzilauskas, Sr	Pana	Christian	60	Both.
Mike Zarasky	Springfield	Sangamon	11	Extracted.
H. J. Bryan	Normal	McLean		Both.
Adam Bodenschatz	Lemont	Cook	180	Both.
S. W. Travis	Litchfield	Montgomery	18	Both.
Wm. Osborn	Morris	Grundy	50	Both.
Robert LaRosh	Pekin	Tazewell	6	
Olive D. Prives	Pekin	Tazewell	29	Comb.
Howard Osborn	Butter	Montgomery	1	Extracted.
Wesley W. Osborn	Hillsboro	Montgomery	10	Extracted.

Name.	Address.	County.	Number of colonies.	Comb or extracted.
Carl Bendor	Forrest	Livingston	160	Both.
Lester Edwards	Piper City	Ford		Comb.
Ralph Annear	Mulkeytown	Franklin	50	Both.
J. R. Wooldridge	Chicago	Cook	200	Both.
Rose R. Morrill	Geneva	Kane		Both.
W. L. Ritter	Hampshire	Kane		Both.
Miss Ann Krier	DesPlaines	Cook		
John Skinner	Albion	Edwards	26	Comb.
Raymond H. Rocke	Morton	Woodford	74	Both.
S. A. Tyler	San Jose	Logan	200	Both.
V. Milum	Champaign	Champaign		Both.
B. F. Bell	Kingston Mines	Peoria	338	Both.
Harry L. King	Springfield	Sangamon	10	Extracted.
E. F. Peterson	Kewanee	Henry		
W. H. Stumm	Edinburg	Christian	35	Both.
C. L. Duax	Chicago	Cook	400	Both.
Mrs. C. L. Duax	Chicago	Cook		
Orville Smith	Greenville	Bond		Both.
S. A. Tyler	San Jose	Logan		
Birgil E. Rocke	Eureka	Woodford		
J. H. Kontz	Buckley	Iroquois	80	Both.
Roy Annear	Mulkeytown	Franklin	50	Both.
Lawrence Rocke	Roanoke	Woodford		
O. R. Matthew	Virginia	Cass	200	Both.

MINUTES OF THE FORTY-FOURTH ANNUAL CONVENTION OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION HELD IN SPRINGFIELD, ILLINOIS. NOVEMBER 1–2, 1934.

The Forty-fourth Convention of the Illinois State Beekeepers' Association held in the parlors of the St. Nicholas Hotel, Springfield, Illinois, was called to order by the President, Mr. C. A. Mackelden, of Jerseyville.

The minutes of the last meeting were read by the Secretary, Mr. E. F. Peterson, and were approved as read. Motion by Mr. W. Osborne, Mr. Tyler, seconded.

Mr. C. A. Mackelden, the President, then made the following committee appointments:

1. Banquet ticket—Mr. F. W. Fredericks, Mr. Ben Miracle, Mrs. Doc Simmer, Mr. John L. Skinner, Mrs. Hoyt Taylor.
2. Resolution Committee—L. C. Dadant, Mr. Rawson, C. F. Earls.
3. Auditing Committee—Mr. Ross Morrill, Geo. Hill, Lewis Dean.
4. Ill. Honey Baking Display Committee—C. A. Mackelden, Elmer Kommer, and J. R. Woolridge.

The financial reports of the treasurer and secretary were read by Mr. Elmer Kommer and Mr. E. F. Peterson, respectively, and referred to the Auditing Committee, who at the final business session on November 2, reported them correct, and on motion were unanimously accepted. These reports showed total receipts of $350.53, and total expenditures of $192.54, leaving a balance on hand for the year beginning November 16, 1933 to October 31, 1934, of the $157.99 balance on hand, $27.20 are funds frozen in the Cambridge bank, leaving total usable funds of $130.79.

Bills outstanding as follows:

E. J. McCormick.....$50.00 salary for 4 months
E. F. Peterson..... 75.00 salary for 6 months

Mr. C. L. Duax, Chief Apiary Inspector, made a report of the activities in the department for 1934. Inspection started April 9, 1934. During the year have inspected 89,115 colonies of bees. They destroyed 9,628 , some were shook and some burned. Most of disease was disposed of.

Mr. Grout was next on the program with a very interesting talk on "Uses of Beeswax." The first reference to beeswax goes back to Greek Mythology. It was used A. D. in artificial flowers, cold creams, and other items similar to those made today. Wax figures have been found in Europe. King Constantine ordered his entire city to be lighted by candles; 100 per cent beeswax candles are used in the Catholic churches

for lighting purposes. More candles are used today than in the days prior to the invention of lamps.

Reports of representatives of local associations: Mr. Skimmer, Mr. Bodenschatz and Mr. Rawson.

The morning session of November 1 was adjourned at 12:30 p. m. and was called to order for the afternoon session at 1:30, with the President, Mr. Mackelden, presiding.

A discussion followed on the American Honey Institute, the manner in which the Association got together with no salary for anyone except two paid collectors at the institute; by Mr. K. Hawkins, of Watertown, Wis., who introduced Miss Jensen, Secretary of the American Honey Institute.

Miss Jensen gave an entertaining and instructive view of the institute which is seven years old. More requests from Illinois Homemakers from first eight months of this year than ever before. There is a decided trend toward honey and types of food we serve with honey.

Recess—2:00 to 2:45. Some plans for 1935. Hope to pass law giving inspector power to condemn forest trees containing bees and to plug bee trees in cities. Another law which is beneficial is to give him immediate power to destroy a colony being robbed. Vigilance Committee intended to cover State with each beekeeping community to have a member on the committee.

The Illinois Honey Institute—Mrs. I. Duax.

The institute during the past year was made up of contributing members donating one dollar each, the manufacturers, ten dollars, and supporting members $2.00. They desire to find a more appropriate name than Illinois Honey Institute or Advertising Committee. It was later decided to call it the "Illinois Honey Foundation."

W. S. Lohnes of Tazewell County gave a brief account of the Minier meeting.

Mrs. Adam Bodenschatz donated a dresser scarf, and Miss Jensen a honey fruit cake, which were raffled off at five cents each or six for a quarter, making ten dollars and thirty cents on the drawings for the "Illinois Honey Foundation" fund. W. C. Sommers, of Tazewell County won the dresser scarf, and Ora Lee Funkhauser, of Saline County won the fruit cake.

Mr. A. L. Kildow, former Chief Inspector, wished Mr. Duax well and bid us goodbye. He is off to Florida.

Fifteen minutes recess before the banquet.

Annual banquet was held in the parlors of the St. Nicholas Hotel on the evening of November 1, 1934. Nearly every dish served at the banquet contained honey, thanks to Mrs. Duax. The attendance at the banquet was the largest since it became a feature of our conventions, the total number of tickets sold was 102. Mr. McLaughlin, Mr. Lloyd, Mr. Ryan, and their wives all were in attendance. Each gave a short talk, including Mr. Dadant, Miss Jensen, Mr. Gill, Miss VanGilder, Rep. M. Bray. After a splendid program by the Duaxes, and the Kewanee String Orchestra, Mr. Roy Baxley, a beekeeper magician, gave thirty minutes performance of excellent magic.

President C. A. Mackelden called the last meeting to order on November 2, at 8:30 a. m. The election of officers was then held:

For President—Mr. V. G. Milum, 51; Elmer Kommer, 28.

For Treasurer—Mr. Wesley Osborne, 43; Adam Bodenschatz, 37.

For Secretary—Mr. Edwin Peterson, 50; Mrs. I. Duax, 32.

The following vice-presidents were elected by acclamation: 1st, Walter Scott Lohnes; 2nd, Adam Bodenschatz; 3rd, H. W. Jones; 4th, A. G. Gill; 5th, R. Gober.

The Illinois Honey Extension Service Committee consists of Mrs. Duax, Mr. Milum and Mr. Osborne.

Mr. L. C. Dadant gave a very instructive talk on the origin and use of the bee escape and the development of the removal of honey by the carbolic acid method. In his speech, "Away With the Bee Escape," he took special pains to warn of the dangers to the operator while using carbolic acid. Mr. Dadant then demonstrated and explained a much talked of "feeder" developed by Brother Adam of England.

Report of the Fact Finding Committee of which Mr. Osborne was chairman.

W. W. Osborne gave an interesting report of the 2,000 miles he traveled through Michigan and Wisconsin, and his visits with fellow beekeepers.

V. G. Milum gave an instructive talk on "New Slants in Bee Behavior."

NOON.

November 2, 1934, afternoon session. Called to order by the new President, Mr. V. G. Milum.

The Auditing Committee report accepted as read with the suggestion that the association secretary purchase the necessary books to establish a ledger system so that the expenditures, receipts, and balance shall be apparent at all times. *Since then the necessary items have been purchased and are now in use.*

The report of the Resolution Committee was read by Mr. Rawson. A motion was made to include a vote of thanks to the Apiary Inspection Division for its work during the past year.

The five vice-presidents with Mr. Osborne as chairman on the Fact Finding Committee.

The Fair Rules Revision Committee was appointed to hold over from 1934 with Mr. Bodenschatz, Mr. Taylor, and Mr. L. Peterson, chairman, as a committee with power to act.

No more business appearing Mr. Milum adjourned the convention in mid-afternoon, November 2, 1934.

E. F. PETERSON, *Secretary.*

RESOLUTIONS APPROVED AND ADOPTED AT THE FORTY-FOURTH ANNUAL CONVENTION HELD NOVEMBER 1–2, 1934.

Be it resolved, That the Illinois State Beekeepers' Association in its Forty-four Annual Convention assembled at Springfield, Illinois, November 1st and 2nd, does hereby approve and adopt the following resolutions, and

Be it further resolved, That a copy of same be spread upon the minutes and copies sent to the various parties concerned.

I.

Be it resolved, That the Association extend its heartfelt sympathy to the family of James A. Stone, much loved and esteemed former secretary and charter member of this Association, whose loss is keenly felt by every member of this Association.

II.

Be it resolved, That the Association extend good wishes to Mr. and Mrs. A. L. Kildow, with the hope that they enjoy a happy and comfortable winter in the Sunny South.

III.

Be it resolved, That the Association voice its appreciation of the good work done by Mrs. Duax, Mrs. Bodenschatz, and other ladies, in boosting Illinois Honey, and in broadcasting its uses to consumers throughout our State.

IV.

Be it resolved, That the Association extend its thanks to Mrs. Malitta Jensen for her presence at this meeting, and for the wonderful message brought to us regarding the work done by the American Honey Institute, and

Be it further resolved, That this Association pledge its utmost support to the institute.

Be it resolved, That we extend our thanks to our retiring officers, and especially to our President, Mr. Mackelden, and our Treasurer, Mr. Kommer, who have devoted so much of their time in the past years in the interests of our Association.

VI.

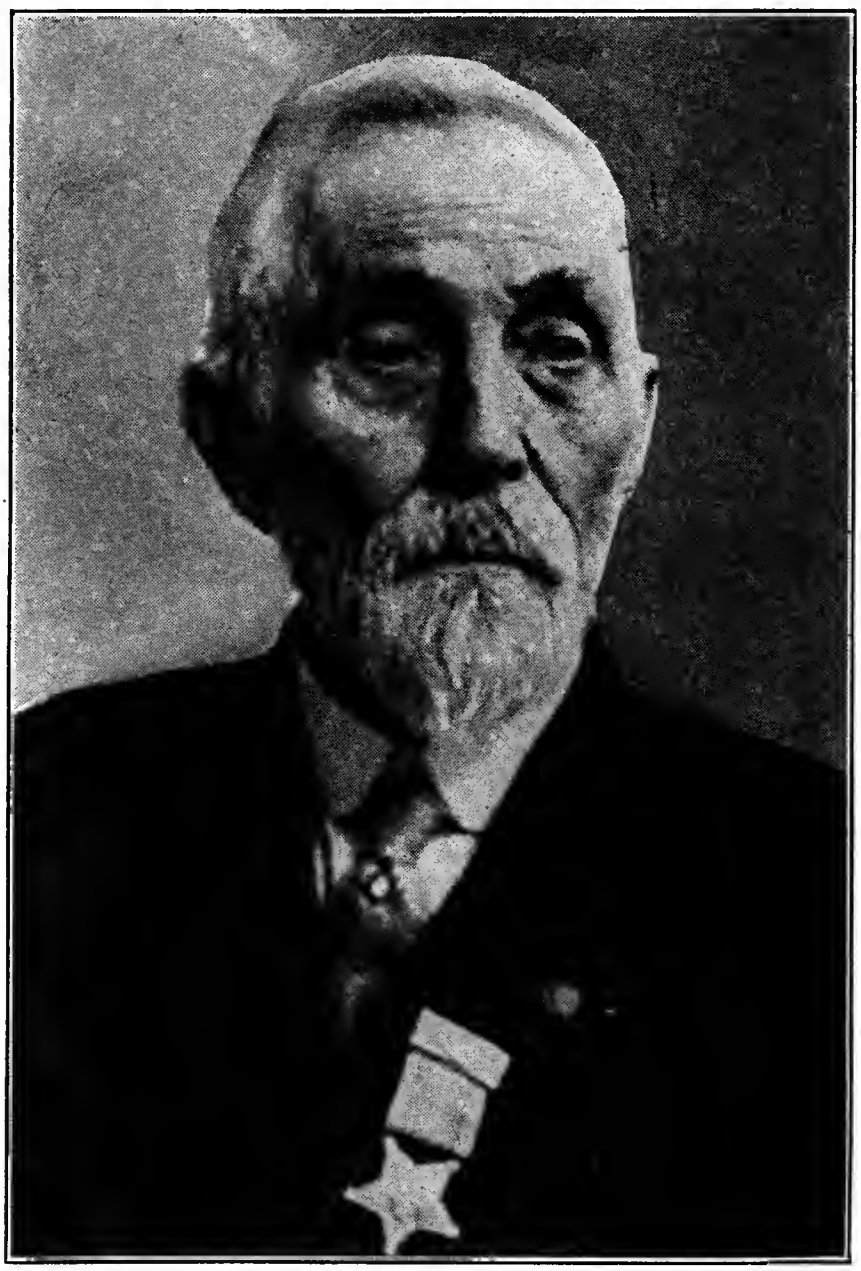
Be it resolved, That a vote of thanks be extended to the State Agriculture Department, especially to the State Fair, and the Apiary Inspection Division for their continued cooperation in promoting the use of money through the inclusion of honey items in the premium list.

VII.

Be it resolved, That a vote of thanks be extended to the management of the St. Nicholas Hotel, through whose courtesy we are permitted to use their parlors and other facilities.

VIII.

Be it resolved, That a copy of this resolution be placed before our Governor Henry Horner, together with the annual report of this Association.



JAMES A. STONE.

IN MEMORIAM.

Seven miles northwest of Springfield on Illinois Route 125, or the old Waubaunca Trail, is a most beautiful place containing several hundred acres. This being the home of James A. Stone, Pioneer Beekeeper.

He belonged to the class of genuine people, whose influence is far reaching, and who, without ostentation, move the world upward to better conditions in every way possible. Having a most genial personality, he was loved by all who knew him.

Mr. Stone was born May 6, 1842 and died October 29, 1934 at the above mentioned place, having resided there his entire life of ninety-two years. He leaves one living son, Percy, who resides at the old home.

His forbears served under General Washington, and he himself being very patriotic left high school and enlisted in the Union army during the Civil War and served for some time. After his return from the war, he busied himself about the farm and home. He was very interested in every branch of scientific work and study, this combined with his ability to learn served him well in making a success of life in all its phases. The desire to learn of the mysteries within the hive led him to keep bees about 1875.

Through his experiments in mastering bee culture, Mr. Stone found that under proper care, bees were a profitable investment. He gradually expanded his yard to 150 colonies in 1900; introducing the Italian Strain into his yard at an early date. As he became older he reduced his apiary to ten colonies which he kept up to the time of his death.

Recognizing the value of sweet clover for bee pasture was one of his earliest advocates. His neighbors demanded he eradicate it on his farm where he had encouraged it to grow along fences and waste ground and later in his pastures. They stoutly supported that he be fined and punished for the offense. With amusement he watched the same people who were opposed to his sweet clover theory, struggle to get a stand in later years.

Early recognizing the need for government aid in promoting the general interests in the pursuit of bee culture, he became one of the Charter Members which caused the State Association to be formed in February 27, 1891, and served as its able secretary for twenty-nine years. This made him one of the best known bee-keepers in the State of Illinois. With the aid of others he caused the State Foulbrood Laws and Inspection Service to be made possible. He also worked and succeeded in getting the State Fair Board to include an apiary exhibit in its catalogues. There he exhibited his fine honey for many years. Being extremely methodical he maintained a complete weather record diary for more than seventy years.

Mr. Stone's passing leaves but one living Charter Member, Mr. C. P. Dadant.

REPORT OF THE TREASURER FOR 1934.

WOODHULL, ILLINOIS, *November 1, 1934.*

To the Illinois State Beekeepers' Association—Greetings:

Herewith is my annual report as Treasurer of the Illinois State Beekeepers' Association, subject to your approval.

RECEIPTS.

No.		
	Balance on hand at last convention	$92.56
(1)	Nov. 15, 1933—Receipt No. 1	17.00
(2)	Dec. 28, 1933—Receipt No. 2	4.50
(3)	Jan. 1, 1934—Receipt No. 3	5.00
(4)	Jan. 31, 1934—Receipt No. 4	6.50
(5)	Mar. 22, 1934—Receipt No. 5	28.00
(6)	Apr. .., 1934—Receipt No. 6	29.00
(7)	Oct. 19, 1934—Receipt No. 7	45.50
(8)	July 23, 1934—Receipt No. 8	15.77
(9)	Oct. 19, 1934—Receipt No. 9	31.50
(10)	Oct. 19, 1934—Receipt No. 10	22.00
(11)	Oct. 23, 1934—Receipt No. 11	9.00
(12)	Nov. 1, 1934—Receipt No. 12	17.00
	Total	$323.33
	Funds tied up in Cambridge Bank	27.20
		$350.53

EXPENDITURES.

Voucher No.		
(1)	Nov. 16, 1933—C. A. Mackelden—Expense to convention	$13.80
(2)	Dec. 8, 1933—Elmer Kommer—Expense to convention	17.76
(3)	Mar. 15, 1934—C. A. Mackelden—Expense to committee meet	10.60
(4)	Mar. 16, 1934—Elmer Kommer—Expense to committee meeting	12.83
(5)	Mar. 16, 1934—Edwin F. Peterson—Expense to committee meeting	13.20
(6)	Jan. 24, 1934—Edwin F. Peterson—Salary for two months	25.00
(7)	Apr. 12, 1934—Edwin F. Peterson—Salary for two months	25.00
(8)	June 18, 1934—Edwin F. Peterson—Salary for two months	25.00
(9)	Nov. 1, 1934—E. J. McCormick—Back salary	50.00
		$192.19
	Check tax (five checks) $0.10	
	Handling charges on M. O. 0.25	
		.35
	Total expenditures	$192.54

RECAPITULATION.

Total receipts	$350.53
Total expenditures	192.54
	$157.99
Deduct frozen funds in Cambridge Bank	27.20
Total balance	$130.79
Outstanding bills:	
E. J. McCormick	$50.00
E. F. Peterson	75.00
	$125.00

(Signed) ELMER KOMMER,
Treasurer, Illinois State Beekeepers' Association.

November 2, 1934.

We, the Auditing Committee, have examined these records and have found them correct.

(Signed) L. A. DEAN,
GEO. H. HILL,
ROSS R. MORRILL, *Chairman,*
Auditing Committee.

MR. E. F. PETERSON
1325 Pine Street, Kewanee, Illinois
Secretary of Illinois State Beekeepers' Association.
(1934-1935)

FINANCIAL REPORT OF THE SECRETARY FOR PERIOD BEGINNING NOVEMBER 16, 1933 AND ENDING OCTOBER 31, 1934.

Balance in treasury at last convention, November 15, 1933..... $92.56

Received by secretary and transmitted to Treasurer or received by Treasurer direct according to the following membership dues Receipt Numbers:

RECEIPTS.

Receipt.	Date received by treasurer.	Descriptions.	Amount received by secretary.	Remitted to treasurer.
No. 1	11/15/33	Members at large	$12.00	
		Menard County	4.00	
		Morgan County	1.00	$17.00
No. 2	12/28/33	Champaign County	$4.50	$4.50
No. 3	1/1/34	Will County	$5.00	$5.00
No. 4	1/18/34	Iroquois County	$6.50	$6.50
No. 5	3/2/34	JoDaviess County	$ 3.50	
		Macon County	11.00	
		Champaign County	.50	
		Tazewell County	6.50	
		Woodford County	3.00	
		Will County	1.50	
		Members at large	2.00	$28.00
No. 6	3/7/34	Henry County	$ 1.50	
		Woodford County	4.50	
		Hancock County	5.00	
		Jersey County	1.00	
		Members at large	1.00	
		Cook-DuPage County	10.00	
		Peoria County	5.50	$29.00
No. 7	8/29/34	Montgomery County	$ 4.00	
		Cook-DuPage County	5.50	
		Henry County	1.00	
		Cook-DuPage County	5.00	
		Morgan-Scott County	2.00	
		Will County	1.00	
		DeKalb-Kane County	7.00	
		St. Clair County	20.00	$45.50
No. 8	7/23/34	Dividend from funds tied in Woodhull Bank	$15.77	$15.77
No. 9	9/14/34	Members at large	$4.00	
		Piatt County	2.00	
		Champaign County	.50	
		Cook-DuPage County	4.00	
		Henry County	1.00	
		Jersey County	2.00	
		Montgomery County	5.50	
		Morgan-Scott County	.50	
		Saline and Gallatin County	3.00	
		Tri-County	2.00	
		Will County	7.00	$31.50

Receipt.	Date received by treasurer.	Descriptions.	Amount received by secretary.	Remitted to treasurer.
No. 10	10/13/34	Fulton County	$1.50	
		JoDaviess County	3.00	
		Jefferson County	4.00	
		Lake-McHenry County	7.00	
		Georgetown	1.50	
		Lake-McHenry County	5.00	
		Jefferson County Ass'n	1.00	
		Tri-County	5.00	
		Cook-DuPage Ass'n	2.00	
		Members at large	1.00	$22.00
No. 11	10/19/34			$9.00
No. 12	10/30/34	Montgomery County	$3.50	
		Bureau County	4.50	
		Members at large	2.00	
		Tri-County	5.00	
		Cook-DuPage County	2.00	$17.00

Total received by Secretary	$230.77
Total remitted to Treasurer	230.77
Balance on hand November 16, 1933	92.56
In Bank at Cambridge (Defunct)	27.20
Total receipts for year ending November 1, 1934	$350.53

Expenditures.

From November 16, 1933 to October 31, 1934, by vouchers as follows:

No.		
(1)	Nov. 16, 1933—C. A. Mackelden, expenses to convention	$13.80
(2)	Dec. 8, 1933—Elmer Kommer, expenses to convention	16.76
(3)	Mar. 15, 1934—C. A. Mackelden, expenses from Springfield-Jerseyville	10.60
(4)	Mar. 16, 1934—Elmer Kommer, expenses to Springfield	12.83
(5)	Mar. 15, 1934—Edwin Peterson, expenses to Springfield	12.20
(6)	Jan. 24, 1934—Edwin Peterson, salary two months (plus $1.00 balance)	26.00
(7)	Apr. 12, 1934—Edwin Peterson, salary two months	25.00
(8)	June 18, 1934—Edwin Peterson, salary two months	25.00
(9)	Oct. 30, 1934—E. J. McCormick, salary three months	50.00
		$192.11
	Tax on five checks	$0.10
	Handling charge on M. O.	.25
		.35
	Total expenditures	$192.54

Recapitulation.

Total receipts, November 1, 1933 to October 31, 1934	$350.53
Total expenditures, November 16, 1933 to October 31, 1934	192.54
Balance on hand October 31, 1934	$157.99
Frozen funds in the Cambridge bank	27.20
	$130.79

The recapitulation total expenditures also include a fifty dollar check to Mr. E. J. McCormick as payment of half of his back salary, this check drawn October 30, 1934.

Bills outstanding:

E. J. McCormick	$50.00
E. F. Peterson	75.00
	$125.00

(Signed) E. F. PETERSON,
Secretary, Illinois State Beekeepers' Association.

November 2, 1934.

We, the Auditing Committee, upon examination of the books of the secretary and the treasurer of the Illinois State Beekeepers' Association find them correct.

(Signed) Ross R. MORRILL, *Chairman;*
L. A. DEAN,
GEO. H. HILL,
Auditing Committee.

REGISTERED ATTENDANCE AT 44TH CONVENTION.

Name.	Address.	County.	Number of colonies.	Comb or extracted.
B. L. Maricle	Brighton		14	Both.
Hoyt Taylor	Pleasant Plains	Sangamon	20	Both.
O. Thompson	Springfield	Sangamon		
Herman Dunhart	St. Joseph	Champaign	57	Comb.
Edward Adam	Strawn		210	Extracted.
Harry Lefler	Hamilton	Hancock	60	Extracted.
Sam Jacker	Shelbyville	Shelby	10	Both.
Harvey Foote	Green Valley	Tazewell	8	Both.
R. E. Rankin	Payson	Adams	7	Extracted.
Theo. Wellner	Joliet	Will	196	Extracted.
S. W. Travis	Litchfield	Macoupin	17	Both.
Edwin Kommer	Andover	Henry	200	Both.
S. A. Tyler	San Jose	Logan	250	Both.
A. L. Holmes	Jacksonville	Morgan	85	Both.
Woodrow Koritz	Buckley	Iroquois		
Malitta Fischer Jensen	Madison, Wis	Dane		
Wesley W. Osborn	Hillsboro	Montgomery	15	Extracted.
Fred F. Bellatti	Mt. Pulaski	Logan	40	Both.
Vincent Peifer	Lincoln	Logan		
Dow Ripley	Taylor Ridge	Rock Island		
Elmer Kommer	Woodhull	Henry	75	Both.
B. F. Bell	Kingston Mines	Peoria	338	
Irene E. Wurts	Glasford			
Mr. B. F. Bell	Kingston Mines	Peoria		
Mr. Floyd Strope	Pekin	Tazewell	38	
Mrs. Floyd Strope	Pekin	Tazewell		
Mr. and Mrs. R. H. Rocke	Morton	Tazewell	103	Both.
Benj. H. Fischer	Roanoke	Woodford	60	Extracted.
Virgil E. Rocke	Eureka	Woodford	100	Both.
Adolph Bartruff	Pekin	Tazewell	10	Both.
Mr. and Mrs. R. LaRosh	Pekin	Tazewell	6	Both.
Mrs. C. A. Mackelden	Jerseyville	Jersey		
Mrs. A. L. Kildow	Putnam	Putnam		
Mrs. T. J. Robins	Ripley	Brown		
Leonard J. Robins	Ripley	Brown	70	20 comb 50 extracted.
I. A. Dean	Big Rock	Kane	50	Extracted.
Ross R. Morrill	Geneva	Kane	150	Extracted.
J. E. Cullison	Shelbyville	Shelby	33	Both.
Laurence Peterson	Kewanee	Henry	250	Both.
Mrs. Hoyt Taylor	Pleasant Plains	Sangamon		
John Skinner	Albron	Edwards	28	
W. G. Duckwall	Jacksonville	Morgan	100	Both.
Adam Bodenschatz	Lemont	Cook	180	Both.
Mrs. Adam Bodenschatz	Lemont	Cook		
Leroy Stockdale	Palos Park	Cook	60	Both.
Mrs. Leroy Stockdale	Palos Park	Cook		
Eleanor Nelon Simmer	Chicago	Cook	7	Extracted.
Irene W. Duax	Chicago	Cook		
C. L. Duax	Chicago	Cook	350	Both.

REGISTERED ATTENDANCE AT 44TH CONVENTION—Concluded.

Name.	Address.	County.	Number of colonies.	Comb or extracted.
C. A. Mackelden	Jerseyville	Jersey	37	Comb.
E. F. Peterson	Kewanee	Henry		
J. N. Kortz	Buckley	Iroquois	100	Both.
Wm. Osborn	Morris	Grundy	40	
I. N. Bailey	Springfield	Sangamon	11	Comb.
W. K. Brown	Springfield	Sangamon	2	
L. C. Dadant	Hamilton	Hancock	350	Extracted.
C. W. Duerrstein	Galena	JoDaviess	60	Both.
John Faist	Freeport	Stephenson	12	Both.
Edward Adam	Strawn	Livingston	210	Extracted.
Hoyt Taylor	Pleasant Plains	Sangamon	20	Both.
Virgil E. Rocke	Eureka	Woodford	100	Both.
Woodrow Koritz	Buckley	Iroquois		
A. J. Street	Waggoner	Montgomery	14	Comb.
A. G. Gill	Chicago	Cook	1	Comb.
Harry L. King	Springfield	Sangamon		
W. E. Frierdich	Belleville	St. Clair	50	Both.
Otto C. Meier	Hoyleton	Washington	22	Extracted.
Reginald Bean	Mt. Vernon	Jefferson	21	Both.
Ora L. Funkhouser	Eldorado	Saline	68	Both.
Harry Lefler	Hamilton	Hancock	60	Extracted.
R. E. Rankin	Payson	Adams	7	Extracted.
Louise Stockdale	Palos Park	Cook	40	Both.
C. F. Earle	Dalton City	Moultrie	360	Both.
C. W. Mussulman	Vammona	Piatt	8	Comb.
John Skinner	Albron	Edwards	28	Comb.
Laurence W. Fischer	Woodson	Morgan	65	Extracted.
C. J. Anderson	Morris	Grundy	150	Extracted.
I. C. Evans	Decatur	Macon	260	Extracted.
W. S. Lohnes	Pekin	Tazewell	29	Both.
C. P. Jankowski	Gurnee	Lake	175	Extracted.
H. J. Bryan	Normal	McLean	45	Both.
A. J. Phillips	Johnston City	Williamson	13	Comb.
M. Doty	Decatur	Macon	48	Comb.
A. L. Kildow	Putnam	Putnam	200	Both.
Laurence Young	Richview	Washington	8	Comb.
W. C. Sommer	Pekin	Tazewell	6	Both.
Adolph Bartruff	Pekin	Tazewell	10	Both.
Robert LaRosh	Pekin	Tazewell	6	Both.
Robert M. Gober	Oregon	Ogle	18	Both.
V. G. Milum	Champaign	Champaign	60	Both.
S. S. Claussen	Oregon	Ogle	60	Extracted.
H. W. Jones	Cary	McHenry	140	Both.
Roy A. Grout	Hamilton	Hancock	50	Extracted.
O. G. Rawson	St. Louis	St. Clair		

A PAPER GIVEN ON THE FLOOR OF THE CONVENTION BY M. G. DADANT.

I think it is desirable occasionally to look back at the past. It gives us a better perspective of the progress that has been made in our line, and also an idea of where we might best seek for further progress.

With your permission, I will do just that.

Sugar cane, to our knowledge, was first discovered in the 6th century, sugar beets in the 19th century. Earlier than the 6th century, therefore, people got their necessary sweets from the fruits, perhaps from the maple trees, but largely from the bees.

The Indian civilization of the Orient was one of the oldest and from its earliest recorded writings, we find the honey bee and honey recorded in songs and in its law codes. The Indian Sun God "Vishnu" was a blue bee in a lotus flower. The Indiana love god "Kama" carried a bow, the string of which was made of bees. This represented that sweet pains were caused by the arrow of love.

In Arabia the bee "Nahlat" was a gift from the gods. Mohammed in his Koran, with its million of Mohammedan followers, speaks of the honeybee and honey as a medicine—a healing for bodily diseases. While the Holy book the "Koran" is equally healing for the soul.

A little later in Egypt the "honey-fly" was supposed to originate from the carcasses of decaying animals. So still there was only a very limited amount known about the natural history of the bee, even though honey was the great sweet, and symbolized to those ancient peoples almost a divine origin.

But in the time of the Greeks and the Romans, the sky began to clear somewhat on the origin of the bee, as well as the place of honey in the diet.

It is true that the queen was still called the king. But Aristotle, Pliny and Virgil have handed down in their writings, observations on bees which have remained as axioms to the present day. Aristotle was really the father of Zoology. With the complete co-operation of Alexander the Great, he made investigations into the animal and insect world which are the basis for our modern knowledge on these subjects. He mentions the wax moth, bee birds, the different kinds of bees within the colony, and the different sized cells with their functions as holders of the pollen, brood and honey.

Even in the lives of Stalwart Vikings of early Norse origin, some of whom were supposed to be the first discoverers of the American continent, honey played a part. The Vikings went to war sure that in Valhalla there would be honey mead for them to drink.

But through all these centuries, a major part of the life of the bee remained a mystery, and beekeeping, of course never entered into chan-

nels of commerce to a large extent. Mr. Geo. S. Demuth some years ago in a series of articles in the American Bee Journal very aptly described the eras of American beekeeping. I have been free to use some of this material and give him credit. He calls this first era of American Beekeeping, the box hive era, extending up to the time when the movable comb hive was invented by Langstroth. And it had extended from the remotest times with only occasionally a bright spot in the development of beekeeping. Aristotle was one of these spots. Another was Francois Huber of France, his work being done about the year 1800. This great naturalist, although blind, through the help of his faithful servant Burnens, performed wonderful and minute painstaking experiments, having to do particularly with the interior of the colony. He went to such lengths as to count one by one the inhabitants of several colonies of bees, even into the tens of thousands, to imprison the queen cells and young queens, to find if possible the function of the queen, the drone and the worker. While Huber was far removed from the movable comb, yet he did perfect a leaf hive, into which he fitted cut combs so that they could be turned like the leaves of a book. A very crude affair, not at all practical, but a great help to him in his entomological work.

So the box hive flourished in all parts of the world until the advent of the Langstroth principle in 1853. Bear in mind I say the Langstroth principle, since Langstroth is to be noted, not for the size of his frame, or of his hive, but for the principle of a hive with movable combs, with top opening. He, himself, was not sure that he had selected the proper size either for his hive or for his frame.

But yet, after the advent of the movable comb, the progress of beekeeping remained slow, since still there was no way in which to get honey from the comb, except by pressing or mashing or squeezing it out, or the alternative of selling it as box honey. I can well remember not so many years ago, when the five-pound wood box with the glass top and a slot in the bottom was sold in quantities for the production of box honey, as I recall, about six of the boxes to the top of a box hive.

Quinby and many others, while they accepted the movable comb idea of Langstroth, argued that a deeper comb, being more like the natural habitat of the bee in her hollow log was best, and held to the deeper comb and larger hive.

About that time, this country was deep in the Civil war with no time for great changes or improvements. Although the honey extractor was invented in Europe in 1865, it was two years later before the first news of it came to America. Similarly comb foundation had been invented in Europe in 1857, but delayed its arrival into this country till after the war. Both of these laid their rapid adoption in this country to the influence of Samuel Wagner, who had started the American Bee Journal in 1861, dropped it during the war, and revived it immediately afterwards.

Then came the rapid growth years of American beekeeping. Italian queens were imported. Foundation mills were perfected by Dunham, Vandervort, and Root. Extractors rapidly improved. With comb foundation came honey section, the shallow super. With the extractor came the possibility for the first time of marketing large quantities of

clear pure honey. Quinby, Harbison, Adam Grimm, E. France and the elder Dadant along with many others made the beekeepers hum with their discussions, mostly good natured, but occasionally sharp in retort.

The comb honey era beginning about 1880 developed a system with its main proponents in Michigan of contraction in size of brood chambers. Best comb honey is produced by a quick honey flow, by a crowded brood chamber. The Michigan leaders soon learned this. Why not then increase crops, improve your quality by contracting more and more? And that is just what they did. The ten frame hive became an eight. If an eight is good, then why not a six? If a Langstroth depth chamber is good, then why not divide it in two. Then take off one of these for the flow, thus contracting still more.

And the results were gratifying. But the fad soon died of its own force. In a few years these same enthusiasts began to complain that their section was no longer a good honey section. They were getting only 25 pounds a year where they had previously gotten 100, then it had dwindled to 10 pounds.

All the while there was a distinct class who had done their own experimenting and were not led aside by the rosy prospects of a pot of gold at the end of the rainbow. They had held for deeper frames, or at all odds larger hives.

In our own recollection we have seen the eight frame hive relegated to the past. The ten frame hive in one story became the standard breeding chamber. Then it was the shallow food chamber for winter and the double ten frame brood chamber for the breeding season, and now the double brood chamber for the whole year, or a big brood chamber in one story, following out the theory of Quinby and Dadant who had tried for themselves and made their own decision in the eighties and stuck to it through the years.

In the meantime, other developments had come. Perfection of package shipping speeded up the opening of new areas to beekeeping. Not only that but heavy winter losses could be recouped without a year's delay for making increase.

To my mind one of the chief factors in the recent development of big beekeeping has been the automobile and truck.

We had an interesting visit from a northern beekeeper the other day who is running 1700 colonies of bees. They are scattered as far as forty miles from the base. The honey comes in to two big radial machines, is thrown out and the supers returned in trucks to that forty mile yard in less time than it would have taken years ago, to make a one way trip to a yard ten miles away with old Dobbin.

And his wintering problem. Some of the big potato cellars up there are empty. All 1700 colonies are safely stored away in a corner of one of these cellars, equipment all safely away in a warehouse, and the owner can go ahead, market his crop or if that is done, play away his time for the winter. Amuse himself in making plans for the coming season.

We are no doubt in an age of mass production. As one beekeeper said, "I can produce honey as cheaply as sugar is sold, and I will keep on doing it at a profit."

All of this may not look rosy to the small Illinois beekeeper where we have apiaries which seldom run to a hundred and none that run to the 1700 of the Minnesota man. Are we then, to go out of business, out of the bee business, I mean?

I think not. In the first place, we get a lot that the big mass producer can never get. We get enjoyment out of a forenoon in the beeyard, just puttering around with our bees. We get the happiness, hunger, and health that pure fresh air, and moderate work give, without overwork, overworry of the big man.

But there are restrictions that we will have to meet. We cannot any more run fifty or a hundred colonies of bees and expect them to keep us. In other words, we will have to put in a cost system and charge to our bees only that part of our time that we spend on them. Even then our costs of production will be higher than those of the big man. Then we will have to sell higher. Either we will have to impress on our customers that our honey is better, or else we will have to use better salesmanship. The man I mentioned previously in my talk, the 1700 colony man, got 4½ cents for his honey. I don't believe any of us want to sell for that. Yet I wonder if the Illinois beekeeper isn't the Illinois beekeepers worst enemy.

Looking over the past, we have had some wonderful progress in beekeeping in the past eighty years. The movable comb hive, the extractor, comb foundation, the section honey box, improved equipment of all kinds, better means of transportation, the bee package, and queen industry development. One wonders what the future can bring in the way of developments that will revitalize beekeeping as much as have these inventions and improvements in the past. We would be an unprogressive people were we to consider our work well done, with nothing for the future.

But how will it come? Will we get that new fangled long-talked-of hive where you hook up your hose like a vacuum sweeper and pump the honey out without disturbing the bees? Perhaps. A beekeeper in Spain thinks he has it already. I doubt this will come in my time. But I would like to make a couple of suggestions.

We have progressed a long way in manipulation, and in instruments for aiding manipulation. I think one of the next moves is to emulate the improvement in other domesticated animals, and improve the race of bees. Not that our breeders have not been doing this very thing during the past three generations. But they haven't had the opportunity. We have it now. The Watson method of artificial queen insemination is a fact. It hasn't been pushed forward. Why? Because there has not been sufficient demand for it. Some day when honey prices get better, and the urge comes on the part of the beekeepers, they will demand the speeding up of this wonderful work, on the part of our government agencies to their ultimate conclusion.

As one beekeeping friend wrote the other day. The black bee was the hustler, she wintered well, on small stores, she built up fast in spring, she could defend herself. She was a product of the survival of the fittest. The Italian bee is an artificial product of modern beekeeping, but she is a good producer, she is nice looking, she is gentle, she does

not run over the combs, she swarms less. Then why not take the good qualities of these races, yes and of the Caucasians and Carniolans too, and throw them all into one standard bee that has all the qualities of all of them, or let three or four breeds if you wish, though all of our bees are for honey; not for different purposes like cream, milk and beef production as are our cattle strains.

So I think we will go forward in the field of bee breeding.

But here is another field. And that is distribution.

For years, beekeepers everywhere have told of the wonderful therapeutic, value of honey. How it will kill ringworm, cure colds, help the diabetic, reduce ulcers, make an ointment. In fact in past I don't doubt but that some time somewhere, some beekeeper has recommended honey for every human ailment. But it has been a hit and miss proposition. Tried out on somebody and succeeded. Used by an isolated physician here and there. No solid backing.

I look for the time to come, and very shortly when absolute and thorough tests on the part of trained scientific men will tell us whether honey is good and if so, just what for. We all know it has eminent qualities, or think we know. It is only for the professional to pin down these qualities and publish them. The market will take care of itself. Just look what tomato juice, carrots, oranges, spinach, have done.

But I do think we can profit by a thorough marketing agency. We have too many honeys in this country, and they range too widely in their elements. Some sort of an agency is going to have to get these results of the professional men, classify them, and then start bottling or canning a honey that will fit the needs for certain purposes. My own physician would be glad to prescribe honey for sweetening of baby foods, but is afraid to because of the variation in the honey offered. He recommends instead a standard Karo.

Not his fault. Chiefly ours, because we have not standardized, because we have not encouraged someone to enter the field of dietetics with a honey that will sell from the drug store and grocery just like any other standard recommended food.

I say I hope that the coming day in beekeeping is the development of the ideal bee and of the fixing of the ideal uses for honey.

In the meantime, let us not be idle. Let us use our best efforts to help the cause of honey distribution by supporting the work of the Honey Institute, an institution, to my mind that has done more to develop the market for honey, and the limited amount of funds it has had to do with than any other organization ever has done for the beekeeping industry.

In the baking trade, honey is no longer an experiment. It is an actual fact. Bakers know what they can do with it. They know that week by week, they can save enough in stale bread to pay for the honey they use. The American Honey Institute put it over.

The flour people, the baking powder, the evaporated milk, the cheese, and many other interests are glad and anxious to boost and recommend honey, once they were sure in their own minds that it was worthy. Many magazines ran feature recipe articles on honey. One

of them recently has gone so far as to say that no American home should ever be without a supply of honey all the year 'round. That is sound building of the industry. We must support it. We cannot let it fail.

Honey is mentioned ten times today in advertising and magazine literature, where it was mentioned once, before the American Honey Institute became active.

We get what we pay for. Think of the results if all of the 800,000 American beekeepers supported the Institute financially as well as morally.

A 2,000 MILE BEEKEEPING TOUR.

(By Wesley W. Osborn.)

As I wrote you July 13th, I made the Michigan Demuth Memorial Meetings, August 1, 2, 3 and 4. With me were O. W. Kennett, Ohlman, Ill., president of our county association, Walter O. Frame, a Hillsboro beekeeper, and his eleven year old son Kenneth, and my youngest son, Howard, the same age as Kenneth.

After a lot of getting ready, we finally got off the night of July 31st, leaving Hillsboro at 9:15 p. m. in a downpour of rain, the first we had seen for weeks, but we could not stay to enjoy it. Twenty miles to Ohlman, and a stop to pick up Mr. Kennett, then east on route 16 to Mattoon, and north on 45. Champaign at 12:25 a. m. If we had known where V. G. Milum lived, we would have gone by and waked him up. We got out of the rain at Paxton, and found the old familiar Illinois dust. Kankakee and east to the State line, Indiana at sun-up, and dry as dry! Not a blade of green in the pastures. Route 2 through Valparaiso, and a stop at LaPorte for breakfast. Howard suffering from car-sickness; no breakfast for him. The rest of them slept more or less, but Howard was too excited for that. Kennett kept a lookout for beehives and "honey for sale" signs, failing which he would call off the "beer" signs, which were plentiful enough. South Bend, Mishawaka, Elkhart, and then Michigan, and a gradual improvement in the drought situation. More beehives and "honey for sale" signs. Sturgis and Coldwater and on down 112 between majestic rows of shade. Ypsilanti at last, noon by our time, and time for lunch; 517 miles of driving, while the rest slept what they could. Howard still sick, so a trip to a drug store to fix him up, and get some post cards (which we did not mail till the next night at Portland).

Getting directions to the Markham apiary, we reached there and cleaned up in time for the program. Dry there, but the alfalfa flow on. Howard made up his bed in the shade of a tree, and caught up some lost sleep. We found around 200 present, the meeting being held under a tent, erected over "bleacher" seats, and a microphone installed on the speakers' platform. Mrs. Jensen, "Institute Lady", reported on the progress of The American Honey Institute. I defy any one to listen to the record she gave us, and then tell me that he does not believe the Institute is doing any good! Mr. H. F. Wilson (maybe I should call him Professor), Chairman of the Finance Committee of the Institute, spoke on its needs, and our need for it. E. R. Root spoke in his own inimitable way on the needs of our industry, Clare Blakeslee, of Schmidt Bros.' Stores, Lansing, Mich., gave us the merchant's viewpoint of honey selling, and several other interesting speakers appeared before us. Several Illinois visitors were there. M. G. Dadant we found

upon arrival, with Mr. A. G. Woodman, who makes bee supplies over in Grand Rapids, Mich. Mr. and Mrs. C. L. Duax, and Mrs. Simmer, were there from Chicago, and Mr. and Mrs. Walter Scott Lohnes, from Pekin.

Mr. Markham kindly gave us permission to camp in his orchard, which we did with a beekeeper and his family from Ohio for our overnight neighbor. He had a pail of Ohio honey with him, which he kindly divided with us, and was it good! A trip to Ypsilanti provided eggs, milk, and other eatables, and supper over, blankets were spread, and soon it was morning. Old ground got pretty hard, though. Breakfast, and on our way, a pair of Howard's socks left hanging in an apple tree.

Ann Arbor, Jackson, Albion, and Battle Creek at 10 o'clock. A trip of inspection through the Kellog plant, that part of it where corn flakes are made. A dandy luncheon, compliments of the Kellog Co., and then the program in their hall. Mr. Kellog welcomed us to Battle Creek, and Miss Barber, their Home Economics Director, told us of their plans for National Honey Week. I wonder how many of us have plans for that week? In addition to the speakers of the day before, Dr. E. F. Phillips appeared on the program, with "Rural Russian Rambles, giving us a true picture of Russia as he saw it first hand. A hail and rain storm interferred with the program in the middle of the afternoon. Leaving at 5:00 o'clock, we started for Portland, driving for 15 miles through a hard rain. In Portland we inspected the new honey house built by Mr. Ralph Blackman. The good book says we shall not covet, but I could use a house like his. Supper at a restaurant, and bed in the park. They put me across a wheel-track, so I did not sleep so good. Forty-one miles to Grand Rapids took an hour out of the morning, arriving at the Pantlind Hotel at 10, to find the tour of inspection cancelled, so we got up one of our own. After an early lunch, we visited the A. G. Woodman Co., took a picture or two, and beat it to the hotel for the program. Milum was there, so it was just as well we did not stop and wake him up. He might have "combed" us. Dr. Phillips spoke on the "Life Work of George Demuth", whom we all knew as editor of Gleanings for these many years, and whom it was my pleasure to meet at the 1933 meetings of The American Honey Producers League and The American Honey Institute, at St. Louis. I wish every beekeeper could have heard this able tribute to the man, Demuth. Next best will be to read it in September Gleanings.

At the close of the program we left Grand Rapids and headed north, towards Traverse City, camping for the night near Big Rapids at Rogers Dam. We found here that the hail which touched us at Battle Creek, had done real damage to the trees and crops. Crops as a rule looked better the farther north we traveled. The boys tried for a fish at this camp, but no luck. The next morning we traveled through some wonderful country, reaching Traverse City in time to get out to James Hilbert's at noon, where we had our lunch under one of his apple trees, in which was hanging a large bear-skin, recently parted company from the original owner. We never did find out where they met this bear, but some of those present were telling about a man having seven hives torn up, presumably by a bear. Kennett told the boys that we would

have to sleep out that night near that place. (Actually it was miles east of us.)

We were much interested in Mr. Hilbert's method of "cut-comb" honey production. He puts out a wonderful product, and so simple the way he does it. He had his helpers demonstrating for our benefit. One of Mr. Hilbert's neighbors, Mr. Geo. H. Kirkpatrick, Kalkaska, Mich., had his machine for "creaming" honey there, and a sample of it's work. It is a novel product, resembling granulated honey with very fine granules or crystals, will stay put when spread, and the flavor seems intensified. I brought some of it home with me, and what there is left, is still in its original condition, although not quite so stiff, due to our warmer weather. Mr. Kirkpatrick says he has some at home which he processed five years ago, and it still remains just as it came from his machine. From the Hilbert honey house we went to the shore of Lake Leelanau for the rest of the program, where Mrs. Jensen gave us a talk on Institute products, backed up by actual samples. You know they were good! M. G. Dadant gave us a picture of the honey market over the United States, advising us not to be too keen to dispose of our honey at a low price. The outdoor supper was going down in great style to conclude the day, when it started to rain, and although some of us had to leave our ice cream, we were glad to see the rain.

Leaving Traverse City at dusk, we headed towards Mackinaw. We drove till late, and finally camped across the road from a thick woods, near Atwood, out in the wilds, as we thought. In the morning, about 4:30, Kennett shook me awake, and "Hey, let's get out of here before this feller sics his dog on us, we're right in his back yard." About a quarter to the south was one farm house, and the same distance to the east was another. We started out again, and ate breakfast at Harbor Springs, reaching Mackinaw about ten, where we stopped over till noon. The boys and I took a swim, but found the water too cold to stay in long. After an enjoyable trip across the Straits via ferry, we headed down the west shore of Lake Michigan, through woods so thick that Dillinger could be hidden there yet, if he wouldn't come out to see his "sweeties", down through Manistique and Escanaba, camping in the park at Stephenson, (it felt like the north pole). Into Wisconsin via Marinette, through Green Bay, Oshkosh, b'gosh, and just out of Fond du Lac the head of No. 1 valve dropped off for no reason at all, and went through the piston head. We limped on in, and six miles farther, to Hamilton, where we camped for the night and repairs. Rain drove us to the car for a while, and after a "bum" night, I rolled up my sleeves, and with Frame's help, we got off again by 1:30 p. m. Watertown was the next stop, arriving at the Lewis factory just at closing time. We went in to say hello to Kenneth Hawkins, anyway, but he was in West Virginia. As we were leaving, Mr. Carriker, who was with Hawkins at our 1933 meeting, recognized me, and kindly took us through the plant, and while nothing was in operation, we came away with a better understanding of how our beehives are made.

From Watertown we went south through Ft. Atkinson, then angled over towards Kenosha, near which my sister lives, and we camped with them that night. After a short visit, we left the next morning, coming

down through Marengo for a sight of Dr. C. C. Miller's old home, which I am glad to say appears to be well taken care of. Then down to Ottawa, and over to Starved Rock. Just like driving in the mountains, only it doesn't last long. The next stop was in Kewanee, where we hunted up our secretary, Edwin Peterson, his father and brother. We found them busy as bees, extracting honey, and other work incident to the apiary, and after a pleasant, but all too short visit, we headed for home, via Peoria and Springfield. Time would not permit a visit with Lohnes at Pekin, or Bell, at Kingston Mines. After leaving Kennett at Ohlman, and Frame and "Buddy" at their home, Howard and I arrived home at midnight of August 8th, lacking nine miles of having covered 2,000 miles on our trip.

It was a wonderful trip, and we saw some wonderful country, but old Illinois still looked the best, even if it was hot instead of pleasant, and we had flies and mosquitoes. The best alfalfa we saw was between Peoria and Springfield, likewise the best soy beans. The best corn was between DeKalb and Ottawa. The best honey crop appeared to be a tie between various locations. Nearly everywhere there was complaint of a short crop, but many, many places had no crop, if the hives without supers were any indication. When we get our production up to where we can contribute $100 to the American Honey Institute, as Oscar H. Schmidt did for the 100 tons he produced last year, then we can truthfully say we have had a good crop of honey.

POLLINATION OF FRUITS.

(R. L. McMumm, University of Illinois, Urbana, Illinois.)

Regular and abundant crops of many of our temperate zone fruits cannot be expected unless a proper selection of varieties is made to insure pollination. The need for a proper choice of varieties has become more necessary since fewer are set in our orchards, this being especially so when large blocks are set. An outline of the processes that take place in pollination and fertilization and some of the irregularities, will bring out more clearly the reasons for many crop failures, even though trees bloom and pollinating agents are present.

For an adequate understanding of pollination and fertilization it is necessary to know something of the structure of the flower and the part each structure plays in the processes. Such being the case it seems advisable to describe briefly an open flower, so that all will be thinking of the same parts, then go back and trace the development of this flower from its initiation and point out some of the irregularities in development that may later affect pollination and fertilization. Let us choose for our flower type the apple, since it is the most important tree fruit in the State. It must be understood that what is said of this flower will not necessarily fully describe the parts in flowers of different species, but the general processes of pollination and fertilization are the same in our fruits.

The Open Flower: Most prominent in the open blossom are the petals, five in number in the apple. These structures play no direct part in pollination or fertilization. Indirectly they may be responsible for pollination, in that bees rarely visit flowers from which the petals are removed. Outside the row of petals are the five green sepals. The sepals, collectively known as the calyx, have no function in pollination or fertilization. The sepals are attached to the upper part of the fleshy receptacle, which enlarges and becomes the edible part of the apple. Botanically the receptacle is not a part of the flower proper. Located about centrally in the receptacle are five carple cavities, in each of which are normally two ovaries. The ovaries after completing their development are the seed. Turning again to the exterior of the flower we find the twenty stamens in a double row just inside the petals. Each stamen has a long stock, the filament, and an enlarged anther on the free end. It is within the four compartments, loculi, of each anther that pollen is produced. Centrally in the open flower are the five pistils. The upper end of the pistil is much enlarged and rough over the surface. This rough surface is the stigma, and it is on this surface that pollen grains germinate. The stem of a pistil is known as the styles, and connects directly with a carple cavity and its ovaries.

Development of the Floral Parts: Contrary to the thought of many, the fruit buds of our tree fruits are developed during the late spring, summer and fall of the year, preceding their opening into flowers. In Illinois the initiation of the apple flower takes place from May to July, depending on whether the trees are in northern or southern Illinois. The first indication that a bud is going to develop into a fruit bud and not a leaf bud is the widening of the crown within the bud scales. From the outer part of this raised crown five protuberances are pushed out, these parts are the undeveloped sepals. Shortly after the sepals are initiated, small out-growths from around the bases of the sepals are formed. These are recognized as stamens. Soon after sepal and stamen initiation; in the center of the crown a hollow depression is formed by the pushing up of the surrounding cells. The hollow cavity is the first stage in the carple cavity development and the cells which are pushed upward will ultimately develop into the pistils. Last to be formed are the petals. The above parts are well advanced by fall, none, however, are mature. During warm periods in the winter and spring there is further advancement and with the opening of spring very marked advancement takes place. When the flower finally opens all parts are fully developed and the blossom is ready for pollination.

Formation of Pollen: Within the anthers and also the ovaries cytological changes are taking place that should be briefly outlined. When first formed the cells of the anther are much alike. Later the innermost cells in each of the anthers, loculi are differentiated from those outermost. These inner cells repeatedly divide, are split apart, thus their numbers are increased. Late in the development of the unopened flower each of the cells in the anther loculi lays down a wall making two halves of each cell, each of these halves lays down a wall making four quarters to each cell. These four quarters mature rapidly and when about mature, the material holding the four quarters together is dissolved out and the four new cells are free in the anther loculi. These free cells are pollen grains. Within a single anther hundreds of pollen grains are developed. Counts made by the anther of 61 varieties of apples gave an average of 4,000 per anther or 120,000 per flower. The lowest count was 662 per anther (13240 per flower). These numbers indicate that even in varieties of low abundance there is ample pollen, provided it is distributed and is congenial with the variety on which it is deposited.

Seed Development: Within the ovule in the carple cavity a large cell is formed. This cell divides, giving rise to two, these two cells divide giving rise to four. The cell at the lower end of the row of four increases in size, while the three remaining cells disintegrate. Within the single large cell other changes take place. The nucleus of this cell makes three divisions, giving a total of eight nuclei. Three nuclei remain at either end of the cell, the other two migrate to the middle of the cell. One of the three nuclei at the basal end of the cell enlarges. This enlarged nucleus is the egg. This egg along with other parts of the cell will develop into a seed, provided the egg receives through fertilization a sperm from a pollen grain.

Since it is necessary for two distinct parts to unite before a seed can be developed and these parts are formed in different floral structures we can think of the pollen grain as the male part of the plant, and the egg, with its subtending parts, the ovary and pistil, as the female part of the plant.

Pollen and Egg Abortion: From the above outline of pollen and egg development it might be inferred that all pollen and eggs were good, as it were, at the time of blossoming. Such is not the case. With all varieties some pollen and also eggs can be found that have not developed normally and thus are useless from the standpoint of fertilization. The percentage of pollen and eggs that do not develop normally varies greatly, some varieties showing a high percentage of abortion while others have low abortion. In the apple, pollen is produced in such abundance that even though there is a high percentage of aborted pollen there is always ample good pollen provided it is distributed. In some fruit species varieties are found in which practically all the pollen is aborted. The J. H. Hale peach is in this class. Some few grape varieties exhibit this characteristic, and in such varieties the stamens instead of growing upright are reflexed.

Egg abortion is probably less frequent in the apple than is pollen abortion. Even though a few eggs in a single fruit of the apple are aborted this would not necessarily mean the fruit would not set. In the apple, normally 10 ovaries, and eggs are developed, and this full component of ovaries is not necessary for fruit set and development. It is evident then that in the apple, abortion of the sex cells will rarely cause a reduction in the crop, but with the drupe fruits a high percentage of egg abortion might reduce the set. On trees that are vegetatively non-vigorous, fruit often fails to set, this is generally attributed to lack of food and not to abortion. Abortion of the egg may, however, be responsible, this being brought about by the weak tree condition.

Killing of Fruit Buds: In a preceding paragraph it has been pointed out that the fruit bud is initiated during the year preceding blossoming. Therefore the buds of our fruits are subjected to the varying changes in weather for a period of 8 to 9 months. Since the bud is subjected to winter temperatures, bud killing can be expected. The degree of bud killing varies greatly depending on the kind of fruit, the time the low temperature occurs, the rapidity of temperature drop, and several other factors. Of our temperate zone tree fruits the peach is least hardy and the apple most hardy. Rarely are apple fruit buds killed by low winter temperatures, but with the peach the entire crop of fruit buds are generally killed by a temperature of –10°F., with occasional 100 per cent kills at –5°F., and some killing even with the hardier varieties can be found when the temperature drops to but zero. When buds are killed by winter temperatures the blossom does not open, since all the floral structures are destroyed.

Another type of killing which is of more interest from the standpoint of pollination and fertilization might be termed "partial bud killing." This type of killing occurs more commonly late in the spring, generally as the buds are swelling or even when the flowers have opened. As the fruit bud approaches the blossoming period its resistance to low

temperatures decreases. Just before the petals expand, temperatures often as high as 25 to 28°F. will kill some of the floral parts of the apple. The expanding peach flower, however, is somewhat more hardy often resisting a temperature of 23°F. The young peach fruit is more tender than the flower and very slight freezing usually kills the undeveloped seed, resulting in the shedding of the fruit. In the flower, the different structures exhibit different degrees of hardiness. The calyx and petals are most resistant, the pistil and ovaries least resistant and the stamen or pollen intermediate in resistance. With such a condition existing it can be seen that when late spring frosts occur the pistils and ovaries might be killed and the remaining floral structures uninjured. Such injury is much more common than is generally appreciated, because such injured flowers open and appear normal unless careful examination of the pistil is made.

Each year this type of injury is to be found in greater or lesser degree depending on the advancement of the flower, and the temperature. In the plum variety orchard of the Horticultural Department, Urbana, during most years a few varieties can be found that show 50 per cent or more such injury and occasionally varieties with 95 to 100 per cent frozen pistils have been observed. The same has been observed with the sweet cherry. It should be apparent, that such ovaries could not be fertilized, thus poor sets are realized.

Pollination: Let us now consider some of the different phases of pollination. Under this heading we must keep in mind that pollination, whether spoken of as cross-pollination, self-pollination, etc., refers to the transfer of pollen from an anther to a stigma. Commercial orchards, however, use the term pollination, to include pollination and also fertilization. Shortly after the flower opens, the anthers split along the two edges, exposing the mature pollen. (The method of anther opening varies in different species.) The transfer of pollen in different species varies, thus with many, wind is responsible for pollen distribution, while with others insects are responsible for transferring the pollen from the anthers to the stigmas. With some kinds of fruits only certain species of insects are the pollinating agents. Our temperate zone horticultural fruits are insect pollinated, excepting the nut fruits which are wind pollinated. Pollen of the wind pollinated species is light and has no tendency to stick together while with the insect pollinated species the pollen grains are more or less sticky which aids in adhering to insects when they come into contact with the pollen.

Although many species of insects visit the open flower of our fruit trees the honey bee is responsible for most of the pollination at least with the tree fruit. In Illinois more than 50 different species of insects have been observed visiting apple blossoms on a single day. Undoubtedly this number would have been increased if night collections had been made. Others have recorded even a greater number of species. The question can be intelligently asked, if so many different species visit the apple why is the honey bee more important than the others? This can be answered by visiting an apple tree on a warm day when it is in full bloom. Such a visit will reveal that there are many species of insects but the honey bee is by far in greatest numbers. This is due to the fact

that the honey bee over-winters in large numbers in the adult stage, while with many species the winter is passed in the pupal, larval or egg stage and but few have transformed to the adult stage by fruit blossoming time. Even those species hibernating as adults are few in number when compared to the honey bee. Your observation will also give you another reason why the honey bee is most important. This insect gathers nectar and pollen for storage, therefore the individuals work as fast as possible. Wild species of bees, except wild honey bees, also gather nectar and pollen but their numbers are generally much less than the honey bee, and they do not make as many visitations. This is also true of other species, which feed only to satisfy their own appetites. The honey bee goes about her work in systematic order, visiting flower after flower in rapid succession, while with most other species the individuals are generally erratic in visitation, sometimes making rather long flights from tree to tree instead of to flowers on the same tree. This seems to be especially so of the bumble bees.

When visiting the blossoms the insects come in contact with the pollen, this adheres to their hairy bodies. Where another flower is visited and the insect's body comes in contact with the stigma, some of the pollen adheres to the sticky stigmatic fluid, thus pollination is accomplished. Nature has provided our different plant species with many and varied shaped floral structures, so that pollination is assured.

Weather and Pollination: Even though the honey bee is the most important insect from the standpoint of fruit pollination, many years the temperature during the blossoming period of our earlier blooming fruits is too low for bee flight. Also, rainy, cloudy and windy days can be expected. On such days, flight is restricted or even checked entirely. It is under such adverse weather conditions that the orchardist is most in need of bees in the orchard, but under such conditions bees remain in the hive. Such being the case, orchardists should provide enough stands so that ample pollination can be secured in a relative short time if native bees are not in abundance. Five or six hours of good pollinating weather usually will insure a crop in orchards planted to varieties that are compatible, and ample pollinating agents (bees) are present. Investigations have shown that one hive per acre is ample in most orchards.

Fertilization: Even though pollination has been accomplished, this does not necessarily mean there will be a crop. An outline of the processes taking place after the pollen is placed on the stigma will make it more clear, why under many conditions crops are not produced. Shortly after the flower opens, the stigmatic surface secretes a viscous fluid which is known as the stigmatic fluid. It is in this fluid that the pollen grains adhere. Providing the temperature is high enough for germination and the pollen grains are good they will germinate, pushing out a pollen tube in a few hours. The rapidity of germination and the growth of the pollen tube varies with temperature changes. Very little or no germination occurs at temperatures close to freezing. As the temperature is increased up to about 70°F. rapidity of germination increases and the rapidity of pollen tube growth also increases. Temperatures above 70°F. have an inhibiting effect, similar to lower temper-

atures. When the temperature is close to 70°F. pollen germinates within a few hours and by the end of 24 hours the pollen tube has made considerable growth, depending of course, on the variety. As soon as the pollen tube is pushed out from the pollen grain it orients itself and starts growing down the style towards the ovaries. When the tube reaches the carpel cavity and comes in close contact with the ovary a part of the contents of the pollen tube carrying the sperms migrates into the ovary, one of the nuclei (sperm) from the pollen grain unites with the egg, while another unites with one of the nuclei located in the center of the embryo sac. The growth of the pollen tube and union of the two nuclei is fertilization, and after this takes place the seed develops.

Self and Cross Pollination: The above is the typical process in fertilization. A further study, with examples, will bring out clearly the reason for the non-setting of some fruits even though they are pollinated. In the above outline nothing was said relative to the rate of elongation of the pollen tube, the time required to reach the egg or the time the egg lives after the blossom opens. These processes will, of course, vary considerably as stated above, depending on the temperature, but for an illustration we will consider the temperature high enough for normal plant activity to take place. Let us suppose that, pollen of the variety Rome (Beauty) is placed on a receptive stigma of the same variety (self-pollinated). The pollen grain will germinate, and the pollen tube will grow down the style towards the ovary. Throughout the entire length of the style the pollen tube grows at a very uniform rate, no acceleration taking place. Before the pollen tube reaches the ovary the egg has died, thus fertilization cannot take place, even though pollination has been accomplished, and the blossom will drop shortly after the petals fall. Varieties responding thus are said to be self-unfruitful and since they are self-unfruitful they should not be planted alone or in large blocks.

Consider now a variety at the other extreme. If Jonathan pollen is placed on the stigma of the Jonathan (self-pollinated), the pollen will germinate, and the pollen tube will grow down the style. Unlike the Rome pollen tube in the Rome style, the Jonathan pollen tube in the Jonathan style, has an accelerated rate of growth as it nears the ovary, i. e. the closer it gets to the ovary the more rapidly it grows. Due to this more rapid rate of growth the pollen tube reaches the ovary before the egg dies, thus fertilization can take place which insures the fruit setting. Varieties responding so are said to be self-fruitful and can be expected to produce crops most years when planted alone or in large blocks. Planting such varieties in large blocks is not advisable, however, because occasionally the variety may, due to some physiological or weather condition react as a self-unfruitful variety.

Between these two extremes are a group of varieties referred to as partial self-fruitful or partial self-unfruitful, i. e. they can be expected to produce a partial crop when pollinated with their own pollen. From an economic standpoint, they should, however, be considered as self-unfruitful.

In the above illustration, a variety was pollinated with its own pollen, i. e. self-pollinated. Consider now cross-pollination, i. e. the

pollen of one variety on another variety. Illustrations using some of the commercial varieties will bring out some of the problems that may be involved when few varieties are planted.

Winesap is self-unfruitful and when self-pollinated will not produce fruit. If this variety is cross-pollinated with Stayman another self-unfruitful variety, no appreciable crop can be expected because Stayman is a poor pollinator for the Winesap, and no fruit can be expected from Stayman because Winesap pollen is not compatible with Stayman. If Delicious, a self-unfruitful variety is planted with the above two varieties, crops can be expected from Winesap and Stayman, because Delicious is a good pollinator for both varieties. No appreciable crop can be expected from Delicious, because it does not set when pollinated with its own pollen, neither will it set when Winesap pollen is used but will have a partial crop when pollinated with Stayman pollen. Using Jonathan with the above three would insure a crop from each variety since Jonathan is a good pollinator for Delicious.

The above paragraphs can be summarized as follows:

(1) A variety may be self-unfruitful, partial self-unfruitful or self-fruitful.

(2) A self-unfruitful variety may or may not be a good pollinator for other varieties.

(3) A self-fruitful variety may or may not be a good pollinator for other varieties.

Pistillate and Staminate Flowers: Some kinds of fruits produce flowers of two distinct kinds; the staminate flower bearing only stamens and no pistils and the pistillate flower which has pistils and no stamens. In the native persimmon the staminate and pistillate flowers are born on different trees, thus to secure fruiting, trees of both kinds must be present to secure pollination. Grape varieties which have reflexed stamens can be considered from the pollinating standpoint as pistillate plants. Some few strawberry varieties are pistillate and must be planted with varieties having perfect flowers to secure fruiting. Some of our native nut trees have both staminate and pistillate blossoms, on the same trees. With the pecan a problem is encountered which is not found in our other fruits. With many pecan varieties the pollen is mature and shed before the stigmas of the variety are receptive, while with others the pollen is mature and shed after the stigmas are receptive. Different varieties of this fruit must be planted together whose pollen is shed when the stigmas are receptive.

It should be evident from the statements and illustrations that pollination and fertilization of our fruits can be influenced by several factors, many of which are beyond the control of the grower. The grower can, however, aid materially in securing crops by the proper selection of varieties that will pollinate one another.

Varietal Combinations for Pollination: Since the varietal combinations are almost unlimited, but a few of the more important varieties will be given along with varieties that have proven to be good pollinators. Information on varieties not listed can be secured from your State Agricultural Experiment Stations. In this list the variety is given, followed by other varieties which are good pollinators.

Apple: (Note—The red sports respond like the parent variety and from the pollination standpoint can be considered as such.)

Ben Davis—McIntosh, Jonathan, Delicious.
Delicious — McIntosh, Rome, Jonathan, Yellow Transparent, Duchess.
Duchess—McIntosh, Jonathan, Yellow Transparent.
Golden Delicious—Grimes, Delicious, Duchess, Rome.
Grimes—Jonathan, Delicious, Ben Davis.
Jonathan—Rome, Wealthy, Ben Davis, Delicious, Duchess, Yellow Transparent.
McIntosh—Rome, Wealthy, Delicious Jonathan, Duchess, Yellow Transparent.
Rome—McIntosh, Wealthy, Jonathan, Delicious, (Yellow Transparent, Duchess, often bloom too late for pollination).
Stayman (Winesap)—Delicious, Grimes.
Wealthy — McIntosh, Rome, Delicious, Yellow Transparent, Duchess.
Winesap—Ben Davis, Delicious, Jonathan.

Peach:

All commercial varieties except J. H. Hale and Halberta are self-fertile.

J. H. Hale—Elberta, Slappy, Carman, Early Elberta.
Halberta—Probably same as for J. H. Hale.

Sour Cherry: Most varieties self-fertile, but advisable to plant more than one variety.

Japanese Plums: Only hardier varieties adapted in southern Illinois. Plant Burbank and Abundance together for cropping.

Damson Plums: Common varieties self-fertile and fruit without cross pollination.

European Plums: Most of varieties adapted in Illinois are partially self-unfruitful or self-unfruitful. Plant two or more varieties to insure cropping.

Hybrid and American Plums: Consider every variety self-unfruitful. Plant more than one variety of the same species. Hybrid and American varieties are not pollinated by European or Damson plums.

Pear: Most of the varieties are partially self-unfruitful or self- unfruitful.

Kieffer—Bartlett, Duchess, Flemish Beauty, Garber.
Garber—Kieffer.
Flemish Beauty—Kieffer, Duchess, Tyson.
Seckel—Kieffer, Duchess, Tyson.
Duchess—(self-fruitful)—Kieffer.

Grape: Varieties having reflexed stamens should be planted with varieties having upright stamens.

Straw-berries: Pistillate (imperfect) varieties should be planted with perfect flowered varieties.

Brambles and Bush Fruits: Self-fruitful enough to give crops when single varieties are planted.

There is a problem to consider, when self-unfruitful varieties have been planted alone or in large blocks or when varieties are planted together that are not compatible. In newly planted orchards the better procedure is to dig up some of the trees and replant with good pollinating varieties. With most planting arrangements if this system is followed, every third or fourth tree in every third or fourth row will generally give good results if bees are used in the orchard.

In old orchards, top working a part of the trees with a compatible pollinating variety can be done. Until the top worked scion wood comes into flowering, bouqueting can be restored to. Bouqueting as the name infers, means bringing large flowering limbs of compatible varieties into the orchard during the blooming season. These limbs should be placed in buckets or barrels of water. If hives of bees are distributed in the orchard, barrels of the flowering branches should be placed about 40 to 50 feet in front of the hive. If no hives are placed in the orchard, better results are secured if smaller branches are placed in buckets and hung in tops of the trees.

If the following points are observed, when trees are ordered, pollination need not be a problem in later years.

1. Provide for cross-pollination, even for varieties that are known to be self-fruitful.
2. Have varieties that bloom at the same time.
3. Plant the varieties in rows four to six trees wide rather than in large isolated blocks.
4. Plant so that no variety is not more than 200 feet from another variety.
5. Have two good pollinating varieties for each variety because many varieties are biennial in bearing and blossom only every other year.

In the bearing orchard crops can be further insured by

1. Keeping the trees in a vigorous condition.
2. Maintaining stands of bees in the orchard during the blossoming period.

THE ANALYSIS OF 25 ILLINOIS HONEYS AND THE QUANTITATIVE METHODS USED.[1]

(G. E. Lynn, V. G. Milum, and D. T. Englis.)

Preliminary to a study of the composition of samples of Illinois honey[2] it became necessary to formulate a scheme of analysis which would make possible the completion of the work with the greatest ease and rapidity. In the main, the plan of analysis is that specified for honey in the methods of the Association of Official Agricultural Chemists (1a). However, certain deviations have been made. A brief discussion of some of the factors involved in the selection of methods for the individual constituents will be given before a detailed outline of the actual procedure is presented.

Although the determination of water content by drying in vacuo at low temperature is perhaps the most accurate for sugar sirups, it requires considerable time and there is always the question as to whether moisture is completely removed before thermal decomposition begins. In the refractometric method no danger of thermal destruction of levulose is possible and the estimation can be made very quickly. The tables of Schönrock (1) designed for pure sucrose, have been shown to give erroneous results when applied to honey (2) but correction figures have been prepared by Marvin (3) which make possible the use of the refractometric value for this product. These facts were responsible for its adoption in the experimental work to be reported here.

For the estimation of total reducing sugars the volumetric method of Lane and Eynon (4) was selected in preference to the official gravimetric methods. No loss in precision results (5) and the operations can be performed much more quickly.

Evaluation of the amounts of the simple sugars, dextrose and levulose is usually arrived at by a direct determination of one of these and calculation of the other by difference from the total reducing sugar expressed as apparent invert sugar. The direct estimation of levulose by a double temperature polarization has not been found entirely satisfactory. Temperature control is difficult and frequently trouble is experienced from leakage at the cover glasses. The selective oxidation method of Nyns (6) has been examined and extended by Jackson and Mathews (7) and has already assumed a place of importance in the examination of levulose products. It has been observed by Schuette and

[1] This work was made possible by a portion of the funds allotted by the Federal Emergency Relief Administration to the University of Illinois, the Departments of Chemistry and Entomology cooperating.

[2] Samples of honey used in this study were made available through the cooperation of the following Illinois honey producers: L. Vannis, Harrisburg; J. Skinner, Albion; E. J. Wagner, Mount Sterling; L. Peterson and Son, Kewanee; Ed. Kommer, Andover; R. Morrill Batavia; C. J. Anderson, Morris; H. Denhart, Saint Joseph; C. L. Duax, Chicago; and H. W. Jones, Cary.

Terrill (8) that under the conditions of reduction some cuprous oxide is formed in a colloidal state and is frequently lost in the process of filtration. Jackson and Mathews (7) point out that the copper reagent is slightly reduced by dextrose and correction can be made for its presence in the final calculation. Similarly, the use of alkaline iodine for the selective oxidation of dextrose (9) has a number of limitations. Chief among these is the fact that substance other than aldoe sugars are oxidized. The extent and rate of reaction are functions of alkalinity, time and other factors. Many of these factors have been studied in detail and many modifications of conditions for a more satisfactory control of the reaction have been proposed (5) (10 a, b, c, d). One of these procedures (10d) was adopted for use and it is believed that the results are of the same order of precision as can be obtained by other existing methods.

The determinations of direct and invert polarization, sucrose, ash, free acid and dextrin were carried out by the tentative or official methods of the A. O. A. C. (1a).

Quantitative Methods.

If the sample for analysis is granulated or in a separated state, great care must be employed in the sampling. If it has granulated and sugar has separated, place the container in a water bath at 50° Centigrade until it is again entirely liquid. Remove any appreciable amount of wax or other extraneous material by straining through a cloth or fine sieve.

Preparation of the Sample for Sugar Analysis: Weigh out the normal weight of the sample (26 grams), and transfer to a 100 c.c. glass stoppered volumetric flask with the aid of water. The total volume should not exceed 60 to 65 c.c. Dissolve by shaking, and add 5 cc. of alumina cream, which is prepared in the following manner:

Prepare a cold saturated solution of alum in water. Add ammonium hydroxide with constant stirring until the solution is alkaline to litmus. Allow the precipitate to settle, and wash by decantation with water until the wash water gives only a faint test for sulfates with barium chloride solution. Pour off the excess water and store the residual cream in a stoppered bottle.

Allow the precipitate formed after the addition of the alumina cream, to settle. Make up to volume using distilled water. If foam obscures the meniscus, a drop or two of ether will remove it. Filter the mixed solution through a dry filter, rejecting the first few c.c. of the filtrate, and keeping the funnel covered with a watch glass to avoid evaporation. In the following procedures this filtrate will be referred to as the "clarified honey solution."

Water.

Connect the jacket around the prisms of a Abbe refractometer to some suitable water supply, which is maintained at a temperature of 20° Centigrade. Place a drop of the honey on the lower prism and

swing it into position. After allowing a reasonable time for the honey to assume the temperature of the prisms (20° C.), take the readings of ten independent settings and calculate the average refractive index. In the table previously mentioned (3) find the water percentage corresponding to the refractive index found.

Reducing Sugars.

LANE AND EYNON METHOD (4)

Preparation of Fehling's Solutions: Solution A—Dissolve 34.639 grams of pure copper sulfate in a small amount of water containing 0.5 c.c. of concentrated sulfuric acid. Make up to 500 c.c.

Solution B—Dissolve 173 grams of Rochelle salts (sodium potassium tartrate) and 50 grams of sodium hydroxide in water. Make up to 500 c.c. Allow to stand for two days and filter through glass wool.

The two solutions are kept separate until needed and then mixed in equal portions.

Procedure: Pipette 10 c.c. of the clarified honey solution into a 250 c.c. glass stoppered volumetric flask and make up to volume with distilled water.

Pipette 25 c.c. of the mixed Fehling's solution into a Erlenmeyer flask of 2-300 c.c. capacity. This is treated in the cold with 1 c.c. less than the required amount of honey solution needed to reduce all of the copper. This amount can be determined by increment. Heat the flask on an electric flask heater, or over a well regulated gas flame using an asbestos wire gauze. Bring to a boil in two minutes. While in the state of mild ebullution add 2 to 3 drops of 1 per cent aqueous methyene blue solution. Titrate while boiling to a colorless endpoint within one minute. Observe the titer, which must lie between 15 and 50 c.c., and find the corresponding factor in the tables made up for 25 c.c. of the mixed Fehling's solution (1b).

Calculation:

$$\frac{\text{Factor}}{\text{Titer}} \times 100 = \text{milligrams of reducing sugar in 100 c.c. of the solution used in the titration.}$$

Dextrose.

IODOMETRIC METHOD (10a).

Preparation of Solutions:

(a) 0.1 N Sodium thiosulfate solution; weigh out 28.5 grams of sodium thiosulfate and dilute to one liter. After mixing thoroughly the solution is allowed to stand for two weeks. If free sulfur has separated, the clear solution is siphoned off. The solution is then standardized indirectly by titration with potassium dichromate.

(b) 0.5 N Sodium Hydroxide solution; weigh out 20 grams of sodium hydroxide and dilute to one liter, using boiled distilled water in the dilution.

(c) 25 per cent Disodium phosphate solution.

(d) 0.1 N Iodine solution; weigh out 12.7 grams of iodine and 50 grams of potassium iodide, make up to one liter, using distilled water.

(e) 0.5 N Sulfuric acid solution; dilute 15 c.c. of concentrated sulfuric acid to one liter.

(f) Starch Solution; mix one gram of starch with a little water to make a paste and dilute to 200 c.c. with boiling water.

Procedure: Pipette 10 c.c. of the clarified honey solution into a 250 c.c. glass stoppered volumetric flask and dilute to volume with distilled water.

Pipette 25 c.c. of the dilute honey solution into a glass stoppered flask of 2-300 c.c. capacity. Pipette in 25 c.c. of the 0.1 N iodine solution and mix thoroughly. Add 10 c.c. of 25 per cent disodium phosphate and 5 c.c. of 0.5 N sodium hydroxide. In a like manner prepare a blank using distilled water in place of the honey solution. Allow to stand in a dark place for one hour, considering the time when made alkaline as the zero time. At the end of the allotted time acidify with 0.5 N sulfuric acid, with care being taken to see that the solution is distinctly acid. Titrate the excess iodine with the standard sodium thiosulfate until a pale yellow color remains. Add 2 c.c. of the starch solution and titrate to colorless. Repeat with the blank.

Calculation: Determine the difference in c.c. of iodine between the blank and the solution containing the sample solution. This difference is converted into milligrams of dextrose per aliquot used by multiplying the c.c. of 0.1 N iodine solution by 9.515.

Sucrose.

Double polarization method (1a).

Procedure: Direct polarization; polarize a portion of the clarified honey solution in a 2 decimeter tube at 20° Centigrade. Take ten readings and apply the zero correction to the average.

Invert polarization; measure a 50 c.c. portion of the clarified honey solution into a glass stoppered 100 c.c. volumetric flask by use of a pipette. Acidify with 38 per cent hydrochloric acid. Allow to stand overnight and then make up to volume. Polarize in a 2 decimeter tube at 20° Centigrade. Take ten readings and apply the zero correction to the average.

Calculation:

$$\frac{100\ (P\text{-}I)}{143.2\text{—}.51} = \text{per cent sucrose}$$

Where,

P = direct polarization
I = invert polarization
t = temperature of both polarizations

Dextrin.

Alcoholic precipitation method (1a).

Procedure: Weigh out about 8 grams of honey (4 grams if honeydew honey) into a 100 c.c. glass stoppered volumetric flask. Add 25 c.c. of warm ethyl alcohol and shake well until the honey is fully dispersed. Make up to volume with 95 per cent alcohol and allow to stand for 24 hours. Decant off the clear liquid through a filter, and wash the flask several times with alcohol, pouring the washings through the same filter. Dissolve out the precipitate in the flask with boiling water and pour through the filter. Catch the filtrate in a dry weighed dish (porcelain) containing 30 grams of 40 mesh sand. Dry in vacuo at a temperature below 70° centigrade and weigh the precipitate. The precipitate is then dissolved in water and made up to a definite volume according to the following table.

Weight of ppt.	Volume
0.0 – 0.5 grams	50 c.c.
0.5 – 1.0 grams	100. c.c.
1.0 – 2.0 grams	200 c.c.
2.0 – 3.0 grams	250 c.c.

Determine the sugars present and subtract them from the weight of the alcoholic precipitate, thus giving the true weight of the dextrin precipitate.

Ash (1a).

Procedure: Weigh out 5 to 10 grams of the sample in a platinum dish of 50 c.c. capacity. The dish should be heated cautiously with a low flame until the material begins to char. Then by placing the flame to the side and top it is possible to promote the charring without excessive foaming. Ignite at a low red heat (600°C), place in a desiccator and weigh.

Free Acid (1a).

Procedure: Weigh out 25 grams of honey, and place in an Erlenmeyer flask of 2-300 c.c. capacity. Dilute to 100 c.c. with previously boiled water and add 2 to 3 drops of phenolphthalein. Titrate to the first pink with 0.1 N sodium hydroxide. Express as formic acid.

HISTORY AND ANALYSIS OF ILLINOIS HONEY SAMPLES.

(NOTE.—Additional information given in explanatory notes which follow.)

Number.	Year.	Floral source.	Locality.	Type.	Polarization.	Water.	Invert sugar.	Levulose.	Dextrose.	Sucrose.	Dextrin.	Ash.	Acidity.	Undetermined.
1	1934	Dandelion	Champaign	Comb	—13.2	15.83	77.57	37.59	39.98	0.00	2.46	.09	.16	3.89
2	1934	Alfalfa and sweet clover	Mt. Sterling	Strained	—8.4	15.36	72.20	38.37	33.83	9.20	0.15	.04	.11	2.94
3	1934	Sweet Clover and alfalfa	Mt. Sterling	Comb	—13.5	16.55	76.68	40.47	36.21	3.78	0.58	.05	.12	2.24
4	1934	Sweet Clover	Morris	Extracted	—19.2	17.70	76.22	40.90	35.32	0.76	1.68	.08	.17	3.39
5	1934	Sweet clover	St. Joseph	Comb	—10.9	15.70	74.63	39.86	34.77	5.95	1.03	.03	.15	2.51
6	1934	Sweet clover	Champaign	Comb	—14.6	16.63	75.56	38.66	36.99	4.32	1.20	.04	.13	2.03
7	1933	Sweet clover	Champaign	Extracted	—17.0	15.90	77.88	40.15	37.53	3.01	0.33	.07	.15	2.66
8	1933	Sweet clover	Champaign	Comb	—17.2	15.80	77.90	40.23	37.67	3.03	0.34	.07	.15	2.71
9	1933	Sweet clover	Champaign	Extracted	—18.2	16.16	76.98	39.15	37.83	1.96	0.04	.05	.17	4.64
10	1927	Sweet and white clover	Champaign	Comb	—9.0	9.90	76.75	47.11	29.64	1.54	1.83	.24	.19	9.51
11	1934	Sweet clover	Kewanee	Comb	—13.9	15.40	77.45	41.37	36.12	2.43	1.02	.14	.17	3.39
12	1932	Sweet clover	Andover	Extracted	—14.9	16.23	70.26	39.42	30.84	5.28	1.92	.20	.18	5.93
13	1933	Heartsease	Champaign	Extracted	—14.6	16.63	75.40	40.67	34.73	2.26	0.42	.09	.11	5.09
14	1933	Heartsease	Champaign	Comb	—14.7	16.60	75.59	41.20	34.39	2.11	0.53	.09	.10	4.98
15	1933	Heartsease	Champaign	Extracted	—15.1	17.60	73.58	43.43	30.15	1.13	0.88	.08	.01	6.72
16	1934	Buckwheat and sweet clover	Andover	Extracted	—17.2	16.73	74.65	39.31	35.44	0.48	2.20	.07	.19	5.78
17	1934	Buckwheat	St. Joseph	Comb	—15.0	16.50	75.89	42.07	33.82	0.75	3.41	.23	.13	3.09
18	1934	Buckwheat	Kewanee	Comb	—15.5	17.47	74.48	40.53	33.95	0.10	1.05	.15	.18	6.57
19	1934	Buckwheat	Batavia	Comb	—11.6	16.46	78.23	41.81	36.42	0.04	2.39	.09	.07	2.72
20	1934	Buckwheat	Morris	Extracted	—18.3	18.93	72.91	38.56	34.35	0.52	1.98	.11	.09	5.46
21	1934	Fall flowers	Harrisburg	Extracted	—15.2	18.50	76.55	42.53	34.02	2.40	1.26	.05	.01	1.23
22	1934	Fall flowers	Albion	Comb	—15.6	15.10	69.50	35.42	34.08	4.39	1.85	.23	.12	8.81
23	1934	Aster (unripe)	Chicago	Extracted	—10.8	24.14	73.25	39.03	34.22	1.07	0.39	.07	.28	0.80
24	1928	Unknown (Fall)	Champaign	Comb	—13.8	13.70	75.32	38.82	36.50	3.12	2.36	.21	.25	5.04
25	1934	Fall flowers	Cary	Extracted	—16.9	17.50	75.69	40.23	35.46	2.47	3.08	.10	.15	1.01

Additional History of the Honey Samples.

1. This sample taken from sections was evidently largely dandelion with possibly a small amount of fruit bloom nectar. A colony on scales in the University apiary at Champaign gained 43 pounds during a 13 day period from April 28 to May 10, during which there was an abundance of dandelion bloom with a continuous period of fair weather. This honey granulated quickly in the combs and again after reheating.

2. This sample was reported as probably largely alfalfa with bees working it feverishly. 1934—a drouth year—apparently was favorable for nectar secretion from alfalfa and seed production which is not common in Illinois except in drouth years.

3. From same apiary as Sample No. 2 at a later date and possibly contained some alfalfa but predominately sweet clover.

4. Extracted honey gathered in July, granulated solid when received in November.

5. Sweet clover honey which possibly contained some Hubam.

6. Sweet clover comb honey.

7. Extracted from completely sealed combs of honey flow from June 9 to July 1, 1933, and removed from bees before August 1, without contamination with honey from fall flow. This is sample D (7) of an accompanying article.

8. Comb honey gathered during same period as Sample No. 7. Note: Similarity of chemical analysis.

9. Similar to Sample No. 7, except extracted from combs not completely capped, thus being honey gathered during latter part of summer honey flow, although check colony on scales showed no gain after July 1st. This is Sample C (9).

10. Comb honey of 1927, a year of considerable flow from white or Dutch clover as well as sweet clover. Honey considerably darkened in 1934.

11. Sweet clover comb honey.

12. Probably sweet clover honey, with special heating to prevent granulation, but with slight granulation, November, 1934.

13. Extracted from completely sealed combs filled from August 20 to September 13, 1933, removed from bees October 5-12, possibly some late fall flower honey. This is sample B (13).

14. Comb honey gathered during same period as Sample No. 13. Note the similarity of chemical analysis.

15. Similar to Sample No. 13, except extracted from combs not completely capped, thus being honey gathered during latter part of fall honey flow. This is sample A (15).

16. Estimated as containing approximately 80 per cent buckwheat, some sweet clover and possibly some heartsease. Heated to 140° F.

17. Probably from two varieties of buckwheat.

18. Buckwheat comb honey.

19. Buckwheat comb honey.

20. Stored in September from buckwheat with some fall flowers. Partially granulated.

21. Probably largely heartsease with some golden rod and other fall flowers.

22. Fall flowers not listed.

23. Squeezed from newly drawn combs before completely ripened. Thought to be aster honey as there were no other plants in bloom. Slightly granulated in November.

24. A dark thick 1928 fall honey of unknown source, not granulated up to 1935.

25. Wild aster, Spanish needle, golden rod and other fall flowers.

Discussion.

Precision in the estimation of sucrose by double polarization may suffer because of a number of possible errors. In general these are more significant when the proportion of sucrose in the mixture is small; which unfortunately is the case in most samples of honey. Particular attention must of course be taken in having the temperature of both direct and invert readings the same since optical value at either time is greatly altered by change in temperature of the solution. Because of the convenience of the method it is preferred to chemical methods.

The choice of a method for the determination of dextrin is limited. The only one which seems generally applicable is the official alcoholic precipitation method. It is recognized that the dextrin precipitate contains gums and allied substances which are likewise insoluble in alcohol. Thus the apparent dextrin content of a certain sample may seem rather high, whereas the whole of the alcoholic precipitate may not be due entirely to dextrin.

The determination of free acidity offers no difficulty except in the choice of an indicator. Some samples of the dark varieties are hard to titrate because of the obscure endpoint. Of the various indicators used, phenolphthalein has been found to be the most satisfactory.

Granulation was noted in samples numbered 1, 4, 7, 9, 11, 13, 20 and 23. The dandelion sample (No. 1) had the greatest tendency towards granulation even after heating. This was undoubtedly due to the high dextrose content. All samples were levorotary. Sample No. 2 exhibited a high sucrose content which was due to the floral scource, alfalfa, and not to cane sugar feeding as might be suspected. Because of the drouth conditions, the water content for the 1934 Illinois Honeys was lower than would be expected in seasons of normal rainfall. The excess of water in sample 23 was due to an unripe condition. This excess no doubt caused a slight fermentation, which accounts in part for the high acidity and unpleasant taste.

The undetermined matter (besides pollen grains and wax particles) consists of albuminoids, fixed and volatile acids, coloring matter, aromatic bodies (terpenes, etc.), higher alcohols (mannitol, etc.) and various other bodies of unknown character.

Literature Cited.

1. (a) Methods of Analysis, A. O. A. C., 1930, page 387. (b) page 527.
2. Fulmer, Park, Bosck and Buchanan, Amer. Bee. J., 74:208 (1934).
3. Marvin, American Bee J., 74:212 (1934).
4. Lane and Eynon, J. Soc. Chem. Ind., 42 T.: 32 (1923); J. A. O. A. C., 12:38 (1929).
5. Lathrop and Holmes, Ind. and Eng. Chem.: Anal Ed., 3:334 (1931).
6. Nyns, Chemical Abstracts, 19:1236 (1925).
7. Jackson and Mathews, Bur. Std. J. Research, 8:403 (1932).
8. Schuette and Terrill, J. Am. Chem. Soc., 52:4960 (1930).
9. Romijn, Z. Anal. Chem., 36:349 (1897).
10. (a) Auerbach and Bodlander, Z. Angew Chem., 36:602 (1923);
    (b) Hinton and Macara, Analyst, 49:2 (1924);
    (c) Kline and Acree, Ind. and Eng. Chem.: Anal. Ed., 2:413 (1930);
    (d) Dykins and Englis, Ind. and Eng. Chem.: Anal. Ed., 3:21 (1931).

THE EFFECT OF METHODS OF PROCESSING, HEATING AND STORAGE TEMPERATURE ON THE CRYSTALLIZATION OF ILLINOIS HONEYS.[1]

V. G. Milum, G. E. Lynn, and K. T. Crum, University of Illinois.

In order to obtain some evidence of the influence of various factors on the crystallization of Illinois honeys after preparation for market, four different lots of honey were collected from the University of Illinois Apiary in 1933. These were subjected to different methods of treatment and then stored at various temperatures as indicated in the following tables and descriptions.

History of Honey Samples.

Sample D (7): Extracted from fully capped combs containing honey gathered from flow[2] extending from June 9 to July 1, 1933, removed from colonies previous to August 1. Predominately sweet clover.

Sample C (9): Extracted from partially capped combs of same period as D (7). Probably contained additional small amount of nectar of miscellaneous midsummer flowers.

Sample B (13): Extracted from fully capped combs containing honey gathered from flow extending from August 20 to September 13, removed from colonies October 5 to 12. Honey was predominately heartsease or smartweed with possibly slight amounts of summer honey included.

Sample A (15): Extracted from partially capped combs of same period as B (13): Honey was predominately heartsease with possibly small amounts of late fall flower honey.

The supers containing the honey were stored in the honey house after removal from the colonies on the dates as indicated until October 16-17 when separate extractions were made of the selected samples using a steam heated power uncapping knife (water eliminated) and a rotary extractor. Approximately 120 pound samples of each lot were strained through ordinary wire screen cloth without heating and stored in five gallon cans. Five pound samples of each were saved for the chemical composition analysis as given in Table 1.

[1] Contribution from the Entomological Laboratories of the University of Illinois, No. 172.

[2] The period of the honey flows was determined from records of a colony on scales which indicated that the early summer honey flow ended on July 1st with no further gains until August 20 to September 13 after which there were no further gains.

Processing Procedure.

Heating Temperature:

Of each of the samples D (7), C (9), B (13) and A(15), four lots of 20 pounds each (16 lots of 20 pounds each) were heated in water baths to temperatures of 130°F, 145°F, 160°F and 180°F and held at these points respectively for 30 minutes before straining.

Types of Strainers After Heating: Each of the sixteen different samples were then divided into three portions which were strained through the different types of strainers as follows:

(F) strainer was silk bolting cloth of 86 mesh or strands to the inch which is comparable to the requirements for U. S. Fancy grade of extracted honey which is required to be as clean as if strained through the same. It is to be noted that the individual threads of such cloth are extremely fine and clear cut with no frayed fibers to impede the progress of the honey or particles that might be in suspension in the honey.

(S) strainer was an ordinary flour sack cloth of 48 mesh to the inch which is commonly used by beekeepers in straining honey. Due to the many loose fibers extending from the individual mesh this cloth apparently has actual filter pores of less size than the preceding silk bolting cloth of 86 mesh to the inch. Evidence in the tables of granulation support this idea.

(M) strainer was a standard filter cloth for milk strainers or outing flannel of 46 mesh to the inch which was supplied by the Dairy Manufacturing Division, College of Agriculture, University of Illinois. Due to the heavy nap on one surface of this cloth it naturally gives filter pores of small sizes which impeded and prevented the passage of honey as well as the suspended particles in the honey such as pollen, flakes of wax and unmelted crystals, the latter of which serve as nuclei for further granulation.

Temperature of Storage.

Of each of the four different original samples of honey heated at temperatures of 130, 145, 160 and 180°F. for 30 minutes and then strained through the three different types of strainers, ten samples of each were placed in glass containers and stored at ten different temperatures from December 14, 1933, to December 31, 1934, when the amount of granulation in per cent was recorded as given in Tables 2-5. The storage temperatures recorded in the first left hand column of the tables were practically constant except for the following:

Two sets of one pound samples were stored in an ordinary class room in which the temperatures varied from near 70°F. to outside summer temperatures as high as 106°F. The second of the samples at room temperatures (room) was covered to exclude the light while the first stood on an exposed shelf. All other samples were stored in cardboard containers. Half pound samples were stored at all other temperatures except test tubes samples at the three lower temperatures.

Samples stored at 77°F. and 59°F. were constantly at these temperatures with variations of only a fraction of a degree while at the lower temperatures the variation amounted to only a few degrees.

Samples listed at (32°F.) and (0°F.) storage temperature were kept at these temperatures for approximately 6 months and then by accident moved up to the 40°F. storage temperature.

On account of the large number of samples to be prepared and treated during the limited working hours available, the actual processing extended from November 14 to December 14, 1933, at which time the various samples were placed in their respective storage temperature chambers.

Determination of Crystallization.

The percentage of crystallization of the honeys as reported in Table 2 to 5 were read on December 31, 1934, slightly more than a year after being placed at the various storage points.

To determine the amount of crystallization in per cent a rule with 100 divisions equal to the column of honey in the jars was used as a measuring guage. However, due to the fact that there was more or less uneven settling of the crystals, estimates had to be made of the approximate level if the crystals were settled out. Comparisons were made with other samples in various groups from time to time so that percentages even though not exact are relative as to the other samples.

For very slight amounts of crystallization the amount is recorded as a trace (T) with the use of T_1, T_2, T_3, T_4, T_5 representing increasingly smaller amounts. All samples recorded as having a trace (T) were not sufficiently granulated to be objectionable to the retail trade, while T_5 where listed represented only one or two small crystals.

TABLE 1—CHEMICAL COMPOSITION OF HONEY SAMPLES.

Number.	Polarization.	Water.	Invert sugar.	Levulose.	Dextrose.	Sucrose.	Dextrin.	Ash.	Acidity.	Undetermined.
D (7)	—17.0	15.90	77.88	40.15	37.53	3.01	0.33	0.07	0.15	2.66
(8)	—17.2	15.80	77.90	40.23	37.67	3.03	0.34	0.07	0.15	2.71
C (9)	—18.2	16.16	76.98	39.15	37.83	1.96	0.04	0.05	0.17	4.64
B (13)	—14.6	16.63	75.40	40.67	34.73	2.26	0.42	0.09	0.11	5.09
(14)	—14.7	16.60	75.59	41.20	34.39	2.11	0.53	0.09	0.10	4.98
A (15)	—15.1	17.60	73.58	43.43	30.15	1.13	0.88	0.08	0.01	6.72

Note.—This table is condensed from a table by G. E. Lynn, V. G. Milum and D. T. Englis in "The Analysis of 25 Illinois Honeys and the Quantitative Methods Used," appearing in the Annual Report of the Illinois State Beekeepers' Association for 1933-1934.

Samples (8) and (14) were sections of comb honey gathered and stored during the same corresponding periods as Samples D (7) and B (13) respectively. Note the similarity of chemical analysis or composition.

TABLE 2—PERCENTAGE OF CRYSTALLIZATION OF HONEY SAMPLE D (7)
(1933 SWEET CLOVER FROM FULLY CAPPED COMBS.)

‡	130° F.			145° F.			160° F.			180° F.		
†	F	S	M	F	S	M	F	S	M	F	S	M
*98° F												
Room	13	6	0.5	4	0.2	T	T_4					
(Room)	11	2	0.5	1	0.2	T						
77° F	7	2	0.6	0.5	T	T_3						
59° F	35	10	20	4	2	0.8				T_1		
50° F	50	30	25	4	5	2	T_4			T_2		
40° F	60	15	4	10	7	0.5						
(32° F.)	80	2	T	0.5	T	T_1						
(0° F.)	20	0.3	T	T	T_3							
—10° F												

* See description in body of article for variations of storage temperatures listed in left hand column of all tables.
‡ Temperatures to which samples heated for 30 minutes.
† Strainers: F, silk bolting cloth; S, flour sack; M, milk strainer.

TABLE 3—PERCENTAGE OF CRYSTALLIZATION OF HONEY SAMPLE C (9)
(1933 SWEET CLOVER PLUS SUMMER FLOWERS.)

‡	130° F.			145° F.			160° F.			180° F.		
†	F	S	M	F	S	M	F	S	M	F	S	M
*98° F												
Room	18	10	3	1	0.3	T	T_3	T_4				
(Room)	15	9	1	1	0.2	T						
77° F	10	3	1	0.5	T_1	T_3						
59° F	45	30	15	5	2	3						
50° F	65	40	50	30	10	2	T_1	T_3		T_2	T_4	
40° F	60	30	45	6	5	1	T					
(32° F.)	45	15	20	1	T	T_2				T_2		
(0° F.)	20	8	0.3	T	T_2					T_4		
—10° F												

TABLE 4—PERCENTAGE OF CRYSTALLIZATION OF HONEY SAMPLE B (13)
(1933 HEARTSEASE FROM FULLY CAPPED COMBS.)

‡	130° F.			145° F.			160° F.			180° F.		
†	F	S	M	F	S	M	F	S	M	F	S	M
*98° F												
Room	T_2	T_2	T_3	T_2	T_2	T_3						
(Room)	T	T	T	T_2	T_3	T_3						
77° F	T_3	T_3	T_4	T_4	T_4	T_4						
59° F	2.5	2	1.5	0.5	0.5	T						
50° F	15	10	20	5	4	1	T_1	T	T			
40° F	0.5	2	1	0.5	1	0.5	0.3		T			
(32° F.)	T	T_1	T	T_2	T_3	T_2					T_5	
(0° F.)	T_3	T_3	T_3	T_3	T_4	T_4						
—10° F												

TABLE 5—PERCENTAGE OF CRYSTALLIZATION OF HONEY SAMPLE A (15)
(1933 HEARTSEASE PLUS LATE FALL FLOWERS.)

‡	130° F.			145° F.			160° F.			180° F.		
†	F	S	M	F	S	M	F	S	M	F	S	M
*98° F	------	------	------	------	------	------	------	------	------	------	------	------
Room	------	------	------	------	------	------	------	------	------	------	------	------
(Room)	------	------	------	------	------	------	------	------	------	------	------	------
77° F	------	------	------	------	------	------	------	------	------	------	------	------
59° F	0.2	1.0	T	T	T	T_2	------	------	------	------	------	------
50° F	1	2	0.5	1	0.5	0.3	------	------	------	------	------	------
40° F	2	5	3	1	0.3	0.7	------	------	------	------	------	------
(32° F.)	T_1	T_1	30	?	T_3	T_1	------	T	------	------	------	------
(0° F.)	T_2	T_1	T	T_4	------	------	------	------	------	------	------	------
—10° F	------	------	------	------	------	------	------	------	------	------	------	------

Discussion of Results.

Effect of Processing Temperature: A study of Tables 2-5 shows that 130°F. for 30 minutes is not sufficient to prevent granulation at any of the storage temperatures except the extremes of (98°F.) and (–10°F.) which are impractical. At (98°F.) all samples were extremely dark in color and would be considered unsalable.

A temperature of 145°F. for 30 minutes is considered satisfactory for heating of honey to kill yeast germs which may later cause fermentation after granulation. However, this temperature is not sufficient to prevent granulation at all of the storage temperatures although nearly satisfactory at 77°F. the temperature of storage which seems most nearly ideal of those tested.

A heating temperature of 160°F. or 180°F. apparently was sufficient to prevent all granulation except in a few cases. However, these samples were darkened somewhat by the higher temperature with still further changes taking place during storage especially at the higher temperatures of storage. Lack of sufficient observations at this time prevents making any more definite statements. Further experiments and observations are to be made along this line.

Type of Strainer: The type of strainer apparently produced a marked effect for the honey strained through the 86 mesh bolting cloth was granulated to a greater extent or equal to one of the others in all but one of each set of 40 samples at each heating or processing temperatures. The ordinary flour sack strainer of 48 mesh with smaller pores due to loose strands of the fibers was far better while the outing flannel except in a few cases at colder storage temperatures was better than the milk strainer. This is apparently because of its finer pore or filter size due to the nap of the cloth. However, it was found that it was harder to get the honey strained through the milk strainer cloth which would necessitate more frequent changing of the cloth if operating on a larger scale.

At the higher temperature of processing the type of strainer apparently was not so important, although evident, because of the crystals which serve as seed for crystallization had been melted and hence less

to strain out. The finer strainer would of course remove other particles in suspension which would not likely be removed by the silk bolting cloth even of finer mesh but of greater filter or pore size.

Effect of Storage Temperature: While there was no granulation of any of the samples at the extremes of (98°F.) and (–10°F.) both of these are impractical and besides the extreme discoloration at the higher temperature renders it undesirable.

A glance at Tables 2-5 shows that if honeys subject to granulation are not processed at sufficiently high temperatures to prevent granulation, then a storage temperature of 77°F. proved to be the best in the prevention of granulation of those tested. Recommendations have been made by others to store honey at temperature near 50°F. to prevent fermentation after granulation. However, the results here indicate the combined total of granulation of the 48 samples stored at 50°F. is greater than the combined total of the 48 samples stored at any other temperature.

The storage temperatures below (50°F.) shows increasing less granulation with none at (–10°F.) which is apparently due to the viscosity or thickness of the honey which prevents the formation of the crystals. However, these lower temperatures are impractical because of the cost of refrigeration.

Effect of Type of Honey: It is generally true with honeys that the higher the relative amount of levulose sugar in the honey as compared to dextrose the less granulation will be present under the same set of conditions and treatment. This is due to the fact that a part of the greater dextrose content is unable to stay in solution at a given temperature.

In this series of samples, the greatest amount of granulation occurred in sample C (9) followed by D (7) with considerably less in B (13) and A (15) in the order named. Consulting Table 1, we see that C (9) has the smallest percentage of levulose and the greatest percentage of dextrose, the sugar that crystallizes out most easily. Sample D (7) being higher in levulose and lower in dextrose shows less crystallization while B (13) and A (15) showing increasing amounts of levulose and decreasing amounts of dextrose which is evident from the Table 1 and by the amount of crystallization. It is to be noted that at (77°F.) and above, sample A (15) shows no evidence of granulation even at processing temperatures of 130°F. which is entirely unsatisfactory for samples D (7) and C (9). It is thus apparent that the processing temperature necessary to prevent granulation is dependent not only upon the storage temperature but upon the chemical composition of the honey, especially, the relative amounts of levulose and dextrose.

Summary and Conclusion.

Judging from the results of these observations the procedure necessary for the successful processing of honey to prevent granulation in storage depends upon the types of honey to be processed and the temperature at which it is to be stored.

The smallest amount of granulation considering all the samples and treatments occurred at the storage temperature of 77°F. which is probably somewhere near the ideal which further investigation should discover.

At the best storage temperature studied of 77°F., heating to 145°F. for processing and straining was almost satisfactory for 0.5 of a per cent in only two samples was the greatest amount of granulation which would not be objectionable to the retail trade. While 160°F. heating prevented all granulation at 77°F. storage temperature, with only a trace at other temperatures, due to the slight discoloration when heated to that temperature for 30 minutes a shorter period or lower temperature is apparently desirable. Possibly with further tests a temperature to that temperature for 30 minutes a shorter period or lower temperanear 150°F. for 30 minutes will be found to be desirable for the type of honeys in question.

Except for removal of smaller particles in suspension the strainer is not as important as the storage temperature except where the latter cannot be controlled.

The amount of granulation as affected by the type of strainer indicates that a cloth of the milk strainer or flour sack type is desirable because of the decreased filter or pore size due to the nap of the cloth. One should be selected that will allow the ready passage of the honey when heated to the desired temperature.

Briefly summarizing from the above results honeys to be put up in glass containers or even in tin containers for the retail trade should be processed by heating to approximately 150°F. for 30 minutes in a water bath, then strained through cloth of mesh and nap of ordinary flour sacking or slightly finer and stored at constant temperatures near 77°F.

DISEASES OF ADULT BEES.[1]

(V. G. Milum and B. D. Burks, University of Illinois.)

The following is an attempt to list the various adult bee diseases, their symptoms, occurrence, and suggestions for treatment where known. Although only a few of the diseases herewith listed are definitely known to be present in the State of Illinois, it is quite possible that several not listed as such are prevalent within the State.

Paralysis.

The name paralysis has been applied to a quite vague condition of sickness of adult bees, often noticed at various times of the year. The symptoms are marked: the bees lose the ability to fly, but they quiver the wings spasmodically, the abdomen becomes much distended, and the body color becomes a shining black. The bees in this condition are usually focibly ejected by the more healthy members of the colony (33). Outside the hive, the bees often climb up grass stems or other like objects and by their violent trembling and intermittent movements of the legs and wings, are very conspicuous. Having died, the bodies of the affected bees quickly decompose, giving off an odor which has been variously described as like that of decaying fish, or like foul brood.

As to the cause for this ailment there is no general agreement. Thuresson (34) attributes these symptoms to the attack of various kinds of fungi ordinarily pathogenic to man and animals. These fungi (*Aspergillus Mucor,* and various yeasts) are supposed to grow on the combs and then be ingested by the bees. However, the disease has been known to appear in hives where the equipment was all new and not moulded. Bacteria have also been designated as the cause of paralysis, but cultural experiments have not been very consistent (38). The bacteria accused of causing this disease are, also, often to be found in healthy bees.

Paralysis occurs spontaneously, often with no very probable predisposing factor; the disease is encountered wherever honey bees are kept. It is possible that this malady of bees is, in actuality, several different, obscure diseases, or it may be no disease at all, but simply poisoning.

Burnside (16), whose conclusion that paralysis is a poorly-understood disease is certainly justified, has performed some controlled experiments with it. He transferred brood from healthy colonies to diseased ones, and part of the bees developing from this brood became diseased. On the other hand, brood from diseased colonies, when transferred to

[1] Contribution from the Entomological Laboratories of the University of Illinois, No. 171.

healthy colonies, developed without showing the disease. He, thus, indicates that paralysis may be an infectious disease transferrable from diseased to well bees.

The senior author has observed a form of paralysis similar to the description given in the first paragraph excepting that the abdomens instead of being swollen and distended were shrivelled. This condition was noticed in colonies at Madison, Wisconsin, and at Carbondale, Champaign and St. Joseph, Ill. In colonies suffering from these symptoms there seemed to be no evidence of transmission to nearby colonies. After requeening the disease disappeared.

On two different occasions our attention has been called to apparently paralysed bees in front of hives with the declaration that the bees were infested with mites which upon examination proved to be nothing more than milkweed pollen in which the bees legs were entangled. However, at first sight this appears to be a form of paralysis.

Nosema Disease.

This is the most important disease of adult bees during the spring and early summer, but it is not particularly malignant (28). The disease, caused by *Nosema apis,* a microsporidian protozoan, is infectious and affects workers, queens, and drones, but does not affect the brood. The protozoan attacks the walls of the midintestine and, occasionally, the Malpighian tubules, and it can be produced artificially in adult bees by feeding honey containing the spores of the parasite.

The parasite has a simple life history. The spores leave the body of the host with the excrement and are ingested without change by the adult bee. The digestive fluids in the midintestine of the new host aid in dissolving the spore covering. The young protozoan emerges from the spore and invades an epithelial cell of the midintestine. All parts of the alimentary canal having a chitinous intima are impervious to attack. Having invaded an epithelial cell, the protozoan grows and multiplies, and soon again produces spores. These often completely fill the epithelial cell. The diseased cells break away from the wall of the midintestine and disintegrate, thus liberating the spores into the stomach contents, allowing them to be carried out with the excreta.

In sections of the diseased epithelium, the glistening spores are quite obvious, while the other stages of the parasite are obscure. The spores are oval, deeply-staining, 4.2 x 2.5 microns.

The infection is spread by robbing and the water supply, if not rapidly flowing. Flowers, wind, bee supplies, and the clothing and hands of the beekeeper are not very likely to be instrumental in spreading an infection of Nosema disease. Dead bees about the hive are not dangerous unless they contaminate the water supply.

This disease occurs in most countries of Europe, England, Canada, and the United States (28); in Germany, this disease has long been known as Die Ruhr (32). White (39) reports that Nosema has been found in 27 different states of the United States, including the plains of the Mississippi Valley.

Under date of March 13, 1935, we have been advised by the Bee Culture Laboratory of the Bureau of Entomology at Washington, D. C. that their records show that Nosema infected bees have been received from the following Illinois counties in the years indicated: Adams—1921; Carroll—1921; Cook—1920, 1923; DuPage—1923 (3 cases from the same apiary); Kankakee—1931; Moultrie—1922; Will—1924; Woodford—1931; Vermilion—1929. This would indicate that the disease is probably quite prevalent in Illinois.

Tests on virulence of the organism gave these results: Spores are killed by being heated in water at 58°C. (136.4°F.), for 10 minutes, and in honey 59°C. is the lethal point. Spores dried at room temperature remained virulent 2 months, those dried at 37.5°C. remained virulent 3 weeks, and when dried at about 5°C. virulence was retained nearly 8 months. When dry, the spores resisted direct sunlight from 15 to 32 hours, and in water, they resisted sunlight 37 to 50 hours. Spores remained virulent in honey stored at room temperature for 2 to 4 months. The spores in the bodies of dead bees kept at room temperature lost virulence in 4 weeks, but dead bees lying on soil did not cease to be infective until 44 to 70 days. A 1% solution of carbolic acid killed all spores in 10 minutes (39).

On the basis of symptoms, this disease is to be recognized by the colony being weak in spring, especially if the brood is normal and sufficient stores are present. If the bees are infected with *Nosema apis,* the stomachs of field bees will appear swollen and light in color; in advanced stages of infection the stomach wall is chalky and is easily torn, and the tissues appear milky when crushed (7). Microscopic examination is necessary to definitely diagnose the disease.

This disease usually disappears spontaneously as summer progresses, as the weaker bees are eliminated. However, weak or failing colonies should be united with strong colonies, or be re-queened.

Amoeba Disease.

The Amoeba disease is almost always found associated with the Nosema disease. The causal organism, *Malpighamoeba mellifica,* is found only in the Malpighian tubules, where its multiplication eventually causes occlusion of the tubules. The ultimate effect is to seriously impair the excretory functions of these organs (8). The disease appears in colonies which appear to have wintered well, but lose numbers gradually during April and May, despite normal production of eggs during that time, and finally die out completely in early summer. The bees do not appear in numbers dead around the hive, but their excrement will be found soiling the hive and the surrounding ground, and from this excrement the spores of the protozoan can be obtained.

This disease is quite rare in Europe, and has only once been reported in America (14). In the diseased bees the spores of this protozoan may be observed in the Malpighian tubules, but as a differential diagnosis based on symptoms, between this disease and Nosema is very hard to make, it is very likely that this disease will not often be reported. In any case, it may be the cause of some instances of so-called Spring Dwindling.

Infective Mycosis.

The term Mycosis includes all diseases due to fungi. Thus, it may include Paralysis, and it does include May disease and the diseases that have been ascribed to *Aspergillus, Mucor, Pericystis, Clostridium,* and the yeasts.

In 1926, Lardinois (22) claimed to have found the causal organism of May disease, one of the most destructive diseases of adult bees, in Europe. His results have been discussed by Burnside (17) and especially by Angelloz-Nicaud. Lardinois, in studying bees diseased with May sickness, claimed to have found *Saccharomyces apiculatus* constantly associated with lesions in the wall of the intestine. He found some pupae which had been thrown out from a hive infected with May disease, and as the pupae were dead, Lardinois concluded that they had died of that disease. He then made cultures in water and honey from some of the tissues of the dead pupae; in all his cultures the characteristic odor of hydromel was quickly produced. On the basis of this, Lardinois came to the surprising conclusion that the May disease is caused by the same organism that ferments mead. Obviously this is the poorest kind of scientific proof, and his conclusions have no validity whatever. Angelloz-Nicaud (5) attempted to obtain pure cultures of this yeast in order to perform inoculation experiments with it on bees, but he failed to obtain pure cultures of the yeast from bees.

However, various fungi are constantly associated with this disease, so that it has become known in Germany as the Mucorine disease (32). If Thuresson (34) is correct in his conclusions, May disease will probably prove to be identical with Paralysis. The symptoms, at least in the adult, are identical for each, but May disease attacks both brood and adults. The abdomens of the affected bees become distended, the power of flight is lost, and the bee takes on a shiny black appearance due to the loss of its covering of hair.

Burnside (18) found that a fungus, *Mucor hiemilis,* may infect internally and kill young bees in the hive should they be exposed to temperatures near 20°C. (68°F.). Under normal conditions the loss of bees from this cause is of little importance since young bees usually remain on the brood combs where the temperature is several degrees above that at which the fungus can attack. When bees are old enough to leave the hive they are no longer susceptible. Burnside states that several *Mucors* commonly occur in bee hives as saprophytic organisms.

Septicaemia.

In 1928 Burnside (15) described a new disease of honey bees, a septicaemia caused by *Bacillus apisepticus.* This disease is highly fatal, but has been encountered but once. The causal organisms were found both in the blood of the bees and in the soil surrounding the hives. Inoculations with the bacteria produced the disease in healthy bees; queens were more resistant than workers and drones. The disease seems to be favored by excessive moisture and shade around the hive. This disease, is, as yet, of unknown potentiality.

Myiasis.

In 1930 Angelloz-Nicaud (1), while studying some diseased adult bees discovered them to be suffering from myiasis caused by an unidentified fly. The fly larva could be induced to attack both living bees and ones just killed; they buried themselves in the tissues of the thorax of the host. He was, however, not able to rear these flies to maturity.

Curled-Wing Disease.

Angelloz-Nicaud (4) also describes a disease he calls the curled-wing disease. In this rare disease, the costal margin of the wings becomes perforated, and discolored. The condition is described as being like tissue "eaten out by a cancer." The use of the wings is eventually lost, and the bees perish. Needless to say, this disease does not occur widely.

Paratyphosis.

Sturges (33) states that he has seen no cases of Paratyphosis in England, although the disease is commonly encountered on the continent of Europe. However, from Angelloz-Nicaud's account of the disease (6), it appears doubtful that this is a distinct disease. In 1920, Bahr examined some bees presenting the symptoms of May disease, and identified a bacterium from them. He designated this organism *Bacillus paratyphus alvei* and presented it as the infective agent of specific, contagious illness of honey bees. Later, other workers found this same organism present in healthy bees, and it was not possible to infect bees with disease with bacteria of this strain growing in culture.

Acarine Disease.

Although this disease does not occur in America, in England and parts of Europe it is the most important of the diseases of adult bees (33). The disease was first noticed in Derbyshire, England in 1902, but its true cause was not discovered until 1920. At that time Rennie made the announcement that the cause of the disease was a mite inhabiting the tracheae or breathing tubes of the bees. He named the organism *Tarsonemus woodi,* but it has since been changed to *Acarapis woodi* (Rennie).

The mites are transferred from diseased to healthy bees by contact, the mites crawling from one to the other (31). As in most other bee diseases, robbing is probably the most important factor in spreading the infection within an apiary. The mites parasitize a very restricted area in the tracheal system; only those tubes lying in direct connection with the spiracle located in the membrane between the pro- and meso-thorax. The female invades the spiracle and begins egg-laying almost immediately in the trachea immediately adjoining the atrium. Mating evidently occurs before the female invades the new host. The eggs hatch to produce the six-legged larvae; on becoming mature, they produce adult males and females. Some of the females remain within the

bee, while others after mating, migrate to the outside of the body of the host.

The one symptom most diagnostic of Acarine disease is crawling: the adult bees, becoming grossly parasitized, lose their power of flight and crawl in masses over the hive or the surrounding objects. This same symptom may be exhibited by Paralyzed bees, but the latter have also a characteristic shiny black appearance.

Within the prothoracic tracheae, the mites live, feed, and reproduce. The food evidently consists in blood which oozes from punctures made by the pair of sharp-pointed chelae of the mites. The female mites have tracheal respiration, but the nymphs and adult males respire cutaneously (8). The feeding of these mites and the irritation produced by their presence probably accounts for the damage they do, although they may inject some toxic substance into the body of the host (33). Their activities undoubtedly produce marked impairment of the respiratory functions of the honey bee. The question of how well the bee has been able to adjust its physiological processes to the accumulated organic wastes produced by these parasites apparently has not been answered.

A number of fumigants have been tried against these mites. Weak sulfur fumes and other mixtures have been used by Rennie. In 1928, Angelloz-Nicaud announced his discovery of the practicability of methyl salicylate for the control of this mite (12), and most of the controlled experiments made with it since have shown it to be quite successful (2, 13). Needless to say, one of the best preventives for this disease is to exercise all possible means toward excluding infected bees from the apiary. We in America are nominally protected by an embargo against the importation of honey bees from the effected areas, but in England it is almost impossible to obtain colonies of bees known to be absolutely free from the parasite, so wide-spread has the parasite become. American beekeepers who desire to import queens from foreign countries must first secure a permit from the Federal Government, after which the queens upon arrival are sent to the Bureau of Entomology for examination for presence of the mites before being forwarded to the importer.

The presence in an isolated instance in Canada of a mite living externally on the bee's body has been reported. Very little has been reported on its activity but it is not thought to infest the tracheal tubes of the bee.

The Bee-Louse.

The presence of the bee-louse, *Braula coeca* in the United States was announced by Philipps in 1923 and in 1925 its habits and activities were described by him (27). At that time it was known only in the state of Maryland, but Argo later reported it from Ohio and Alfonsus reports specimens having been found in Wisconsin and in northern Illinois. This would indicate rather wide distribution although it is not commonly observed.

The bee-louse is not a true parasite for in the adult stage it simply sucks its food from the outstretched mouthparts of the worker bee upon which it is found during the brood rearing season. At other times they may be found on the body of the queen. The real damage of the bee-

louse is due to the feeding habits of the larvae which make very minute tunnels underneath the cappings of comb honey. Care should be taken not to confuse this injury with that of the greater wax-moth larvae whose tunnels contain fine silk-like webbings not present in *Braula coeca* which is not a moth.

Dysentery.

Dysentery is without doubt a physiological disturbance, not involving pathogenic organisms. The bees, having been fed improper food, or subjected to improper wintering conditions, find it necessary to deposit the accumulated excrement contained in the rectum, but being prevented from making a flight, by cold weather or other conditions, become diseased due to the undue retention of these feces. Finally, many of them die, some depositing their excrement inside the hive on the walls, floor or combs. The feces are dark and muddy in appearance, and give off a peculiarly offensive smell (20, 21). Angelloz-Nicaud (3) is of the opinion that Dysentery is only a consequence of the Acarine or Nosema disease, but his statement does not appear to be justified by the facts, at least in America.

Fermented or unsealed stores for wintering, honey dew in the honey, excessive moisture in the hives, and any factors which (like sudden high temperatures) tend to cause the consumption of more food than is necessary for normal wintering, will cause dysentery (26). If for any of the above reasons, the colony is stimulated to the point of rearing brood then the additional consumption of food only further aggravates the condition which usually leads to the death of the colony unless opportunity for a good cleansing flight is possible. If the colony survives the winter, it will recover after good flight weather returns, but the colony will be badly weakened, and should be united with a strong colony.

In cases where colonies in an apiary are definitely known to have gathered considerable amounts of honey dew it is advisable where bees are confined for long periods of time during the winter to feed such colonies a liberal supply of sugar syrup for winter stores. Some beekeepers feed all colonies one or two ten-pound pails of syrup late in the fall which serves as the early winter stores for the colony and delays the time at which the colonies consume the dysentery producing honey dew stores until there is greater opportunity for flight and elimination of feces.

Diseased Conditions Due to Poisonous Plants.

The Buckeye (*Aesculus*) in California secretes a nectar which is poisonous to all stages of the honey bee (37). This nectar is only collected when other nectars are lacking, or when the honey flow is suddenly interrupted. When this poisoned nectar is fed to the queen, she quickly loses her egg-laying ability. It is suggested that the colonies be moved away from the locality while the buckeye is in blossom. The gum exuding from the feeding punctures of other insects is also collected

by the bees (in the absence of nectar) and probably contributes to the poisoning of the colonies.

Western False Hellebore (36) has been shown to be poisonous to adult honey bees in California, and in the Western desert regions, adult bees have been found dying on Spotted Loco weed (35). The bees either die directly on the plant or on the way back to the hive. The brood is, under these circumstances, to be found dying of starvation.

Arsenical Poisoning.

The much discussed question of poisoning of bees by arsenicals applied to plants as sprays or dusts has again been brought to the attention of American apiculturists and especially those of the State of California where large losses were incurred in certain areas in 1934 due to the activities of certain insecticide companies in dusting large areas by means of airplanes with the result that the dust drifted to nearby fields where the bees gathered the poisoned materials from flowers of other plants.

As a result of this experience, California beekeepers have been instrumental in having a law presented to their legislature limiting and regulating the application of poisonous sprays and dusts by commercial concerns, especially those who do not confine the spray or dust to the fields being treated.

The conditions and the symptoms of the bees suffering from arsenical poisoning are well described by Eckert (19) in an article appearing in the American Bee Journal for February 1935, which we suggest be read by those not familiar with the symptoms of arsenical poisoning.

Conditions and symptoms similar to those described by Eckert existed in several apiaries in Champaign, Illinois in 1933. In two instances the cause could be traced to untimely spraying of fruit trees in the immediate vicinity of the apiaries. Numerous complaints have been received from other sections of Illinois regarding the poisoning of bees due to sprays being applied while the fruit trees were in full bloom. The most serious losses have occurred during years with wet cold weather during the spring blooming period which has not been explained satisfactorily.

Reports by the senior author (24, 25) of the findings in some of these cases showed that the fatal dosage of arsenic was apparently much less than that reported by previous authors (23, 30). Milum also found that when analysis was made of the dead and crawling bees in front of the poisoned colonies, those bees with distended abdomens showed the presence of arsenic while those with normal abdomens indicated absence of arenic possibly due to elimination before death or previous to time of collection.

Further observations made by Milum in 1931, not previously reported, showed the presence of .01 milligrams of arsenic trioxide (As_2O_3) per 200 bees in two samples each of sick bees. Similar results were obtained upon analyzing the alimentary tracts of two samples of 200 bees each, while no arsenic was found when the remaining portions of the bodies were analyzed. Likewise no arsenic was found in a check sample of 200 bees gathered from an apiary about one mile distant where no evidence of apparent spray poisoning was visible. The

amounts herewith reported suggest that .0000+38 milligrams of arsenic (As) is sufficient to cause death to an individual bee which is approximately one tenth of the previously suggested minimum fatal dosage of .0004 milligrams of arsenic (As).

Conclusion.

In America the diseases of brood are much more important than are the diseases of adults, but in Europe the reverse is generally true (33). The greatest losses of adult bees occurring in Illinois as a result of any of the diseases and conditions listed herewith are probably due to arsenical poisoning, dysentery, Nosema and paralysis although it must be remembered, however, that there are always a number of diseased adult bees submitted for analysis and diagnosis which cannot be successfully diagnosed. As Phillips (28) has stated, "This is due partly to the fact that certain diseases of adult bees exist for which the cause has not been determined." The problem is further complicated by the fact that as soon as death occurs, the bodies of the bees are invariably invaded by secondary, saprophytic organisms which make diagnosis either very questionable or impossible.

Bibliography.

1. Angelloz-Nicaud, E., "Une Nouvelle Maladie de l'Abeille Adults, l'Apimyiasis ou Maladie de la Mouche," *L'Apiculteur*, vol. 74:14-19, 1930.
2. ——— "L'Acariose est Vaincue," l.c., p. 10-14.
3. ——— "La Dysenterie," *L'Apiculture Francaise*, vol. 35:206-208, 1927.
4. ——— "Mal Des Ailles Frisees," l.c., p. 208-209.
5. ——— "Mal de Mai," l.c., p. 263-267, 292-295, 317-321; vol. 36:15-17, 41-42, 1928.
6. ——— "Paratyphose," vol. 36: p. 42-43.
7. ——— "La Nosemose," l.c., p. 152-159.
8. ——— "L'Amibiose," l.c., p. 179-180.
9. ——— "L'Acariouse," l.c., p. 180-185.
10. ——— "Parasitologie de l'Abeille Adulte," l.c., p. 266-270.
11. ——— "Bacteriologie de l'Abeille Adulte," l.c., p. 270-274.
12. ——— "Experience de Traitement contre l'Acariose," l.c., p. 289-295.
13. ——— "Le Traitement de l'Acariose par le Salicylate de Methyle," *L'Apiculteur*, vol. 40:41-43, 1932.
14. Bulger, J. W., "Bee Diseases of Minor Importance," *Journal of Economic Entomology*, vol. 21:376-379, 1928.
15. Burnside, C. E. "A Septicemic Condition of Adult Bees," *Journal of Economic Entomology*, vol. 21:379-386, 1928.
16. ——— "Preliminary Observations on 'Paralysis' of Honey Bees," l.c., vol. 26:162-168, 1933.
17. ——— "Fungus Diseases of the Honey Bee," U. S. D. A., *Technical Bulletin* 149, 1930.
18. ——— "A Disease of Young Bees Caused by a Mucor. *American Bee Journal*, vol. 75:75-76, 1935.
19. Eckert, J. E. Airplane Dusting and its Relation to Beekeeping. *American Bee Journal*, vol. 75:59-61, 1935.
20. Kelty, R. H., "Diseases of Bees in Michigan," Michigan Agricultural Experiment Station, *Special Bulletin* 107, 1921.
21. Lance, H. Willoughby, "Bee Diseases, Prevention and Cure," Western Australia Department of Agriculture, *Leaflet* 152.
22. Lardinois, Dr., "Le Mal de Mai," *Le Rucher Belge*, vol. 33:102-107, 1926.
23. Mc Indoo, N. E., Effect on Honeybees of Spraying Fruit Trees with Arsenicals. U. S. D. A. *Dept. Bul.* 1364, 1926.

24. Milum, V. G., "Death of Bees from Spray Poisoning Not Yet Sufficiently Proven." *American Bee Journal*, vol. 68:179-180. 1928.
25. ——— "Further Notes on Spray Poisoning" l.c., vol. 70:176-178, 1930.
26. Phillips, E. F., "The Treatment of Bee Diseases," U. S. D. A., *Farmers' Bulletin* 442, 1911.
27. ——— "The Bee-Louse, *Braula coeca*, in the United States," U. S. D. A., *Department Circular* 344, 1925.
28. ——— "The Occurrence of Diseases of Adult Bees," U. S. D. A., *Department Circular* 218, 1922.
29. ——— "The Occurrence of Diseases of Adult Bees, II," U. S. D. A., *Department Circular* 287, 1923.
30. Price, W. A., "Bees and Their Relation to Arsenical Sprays at Blossoming Time," Purdue University, Agr. Expt. Sta. *Bul.* 247, 1920.
31. Rennie, John, "Acarine Disease of Hive Bees: its Cause, Nature, and Control," North of Scotland College of Agriculture, Bulletin 33, 1927.
32. Schussler, J., *Roth-Schüsslers Imkerschule*, J. J. Reiff, Karlsruhe, fifth edition, 1920.
33. Sturges, A. M., *Practical Beekeeping*, Cassell and Co., London, 1924.
34. Thuresson, G., "On the Toxicity of Moulds to the Honey Bee and the Cause of Bee Paralysis," *Svensk Botanisk Tidskrift*, vol. 11:33-38, 1917.
35. Vansell, G. H., "Adult Bees Found Dying on Spotted Loco," *Journal of Economic Entomology*, vol. 27:635-637, 1934.
36. ——— and Watkins, W. G., "A Plant Poisonous to Adult Bees," l.c., vol. 26:168-170, 1933.
37. ——— "Buckeye Poisoning of the Honey Bee," University of California, Agriculture Experiment Station, *Circular* 301, 1926.
38. White, G. F., "The Bacteria of the Apiary," U. S. D. A., Bureau of Entomology, *Technical Series* 14, 1906.
39. ——— "Nosema Disease," U. S. D. A., *Department Bulletin* 780, 1919.

WHAT MOTHS INFEST BEE COMBS IN ILLINOIS?[1]

(V. G. Milum and H. W. Geuther, University of Illinois.)

Due to the fact that there seems to be some misunderstanding regarding the habits and activities of the greater wax worth, *Galleria mellonella* L., and some apparent confusion in identification from the lesser wax worth *Achroia grisella* Fabr., the authors offer the following observations in an attempt to add to the general knowledge of the former and to clear up the confusion regarding the latter.

The numbers of eggs laid by individual females of the greater wax moth, *Galleria mellonella* L., varied from 400 to 839 in a group of 12 females, the average being 754 per individual. Eggs were deposited singly to as many as 127 in one group. The proportion of sexes in one group of 323 adults was 172 males to 151 females.

Unmated and separately confined females began to oviposit within 36 hours after emergence but the eggs never hatched although subjected to the same conditions as normal eggs which hatched.

To test the preference of the females for egg laying positions, a number of pieces of brood comb were suspended on the points of six-penny nails projecting through pieces of comb honey sections which were in turn laid on other pieces of section and fastened in place by glue at one end. The nail head prevented full contact of the two pieces of section at the opposite end. Several moths were released in the container and after 24 hours the combs and supports were examined for the presence of eggs. While the moths frequented the combs in great numbers, no eggs were found upon the pieces of brood comb except those laid in tiny crevices where the cocoons were pulled away from the waxen cell walls. On the other hand, the vast majority of the eggs deposited were found between the closely attached ends of the two sections and where the sections rested upon the underlying support thus indicating that the moths preferred to lay their eggs in cracks and crevices which barely admitted the ovipositor. In nature, this apparently serves as a means of protection for the eggs. It would also indicate that in the case of comb honey, especially, where moths have not had access to the inner hive parts and combs that excessive damage could be prevented by destroying by some means the eggs around the edges of the hive body or by removing the sections from the comb honey super immediately after removal from the colony or else follow ordinary fumigation methods to prevent all damage to the combs.

[1] Contribution from the Entomological Laboratories of the University of Illinois, No. 170.

In warm weather, the eggs may be hatching over a prolonged interval which means that the tiny larvae may be constantly entering the hive through the cracks and unsealed crevices. These tiny larvae may gain access to the combs but would soon be detected and removed by the bees whereas when removed from the bees serious damage results if the combs are not fumigated properly. Extreme care should be exercised in storing the comb honey as well as other combs in a moth proof room where a reinfestation may be established by moths emerging from unfumigated combs and then laying their eggs in the cracks and crevices of the section containers or supers. The female adult moths must be kept away—they do not need to get inside to cause further trouble.

Certain observations on the larval habits of *G.* mellonella, the greater wax moth, under restricted food conditions lead us to suspect that the injury of the latter on comb honey is often incorrectly laid to the lesser wax moth, *Achroia grisella* Fabr. In fact, we have had various individuals indicate that the tunnelling in cappings of comb honey under Illinois conditions was that of the lesser wax moth but we believe that in practically all cases, these larvae would prove to be the young of the greater wax moth if they were located and transferred to a diet of brood combs. We recently examined several dozen unfumigated tunnel-damaged sections of comb honey without finding a single living larvae and no adults within the containers. In support of our theory we offer the following information, the obtaining of which was stimulated by casual observations of two larvae approximately 3/8 inch in length, supplied by an Illinois beekeeper who found them tunnelling in comb honey. One of these larvae was placed on brood comb and developed into a full sized adult male greater wax moth. The other larva was placed on a section of comb honey and although it lived for several weeks, grew smaller and smaller, apparently with each succeeding molt, and eventually died, no doubt, because of the lack of proper food elements in comb honey which are ordinarily in brood combs.

Other normal larvae taken from brood combs were placed upon comb honey as their sole diet. Only the larger larvae pupated and emerged as adults, while the smaller ones grew smaller and eventually died. Insufficient observations do not permit us to indicate whether such larvae, having reached a certain instar are able to continue their development but such seems to be the case.

On the other hand it is quite a common observation that when a certain group of greater wax moth larvae are allowed to feed upon a limited supply of brood combs, the first one or more generations of adults will be of normal size, but as the supply of available food diminishes, the succeeding generations of adults become smaller and smaller. Under such conditions adults varied in size from 17 to 5 millimeters in length. The difference in size, no doubt, is due to the lack of sufficient food supply for growth of the larger individuals yet allowing for completion of the life cycle, the adults of which seem to be able to reproduce normal offspring if a new food supply is given.

While the authors have not been able to secure any specimens of the lesser wax moth in Illinois, we have been assured by various individuals that it is actually here. However, we believe that if present at all, it is indeed very rare. The senior author recently received larval specimens from North Carolina which developed into adult lesser wax moths but specimens from two other states proved to be the greater wax moth. Reports from California, Colorado, Ohio, Texas and other states would indicate that it might be rather generally distributed, but more observations are needed to establish its general prevalence. We are indebted to Dr. Carl Heinrich of the U. S. Bureau of Entomology for the information that the U. S. National Museum has specimens of the lesser wax moth, *Achroia grisella* Fabr. from Washington, D. C.; Somerset, Berwyn and Plummer's Island in Maryland; Fairfax Co., Virginia; Chicopee and Amherst, Massachusetts, and Jefferson, Ohio, as well as several foreign countries.

Besides the greater wax moth, the authors have also found that in Illinois dry brood combs when stored at room temperatures may commonly be infested with the larvae of the Indian meal moth, *Plodia interpunctella* Hubner, especially if a few dead bees are in the combs. However, we have found no serious damage as a result of such infestation.

The larvae of the bee-louse, *Braula coeca* also causes damages to comb honey by its tunneling beneath the cappings. However, the bee-louse is not a moth. The tunnels of the louse are much finer and do not have silken threads in them as in the case of the greater wax moth. The surface of the comb is punctured and broken in the case of the moth with particles of frass scattered over the surface. The bee-louse was first reported to be present in the State of Maryland but has been reported from Ohio, Wisconsin, and northern Illinois which would indicate rather wide distribution although not commonly observed. The adult louse may be found on the adult workers during the brood rearing season where they obtain food from the outstretched mouthparts of the workers. At other times they may be found on the body of the queen but appear to do no damage to either.

COUNTY ASSOCIATION ACTIVITIES FOR 1933–1934.

Annual Meeting—Cook–DuPage County Association.

President—Mr. E. J. McCormick.
First Vice Pres.—Wm. C. Young.
Second Vice Pres.—Mrs. Frank Hofman.
Third Vice Pres.—Dr. W. C. Ladwig.
Fourth Vice Pres.—Adam Bodenschatz.
Fifth Vice Pres.—Edw. W. Nowack.
Secretary and Treasurer—Leroy Stockdale.
Hostess—Mrs. Adam Bodenschatz.

The fourteenth annual meeting of the Cook-DuPage Beekeepers' Association was held Saturday, February 24, 1934, at the Bismarck Hotel, from 2 p. m. until 10 p. m., with a banquet at 6 p. m. The above officers being elected for the year 1934.

The attendance at this meeting was very encouraging for the first meeting of the year, with forty-four attending the banquet.

The secretary's report for the year 1933 was read and accepted. The treasurer's report for the year 1933 was read and accepted, with the approval of the Auditing Committee, consisting of Mr. Adam Bodenschatz, Mr. Gun Mozee and Mr. M. Guthrie.

Under new business it was moved by Mr. A. Bodenschatz and seconded that the offices of secretary and treasurer be held by one officer as in the past.

Motion made by Mrs. C. L. Duax and seconded that the office of hostess be an elected office.

The following members have consented to serve on the refreshment committee: Mrs. A. G. Gill, Mrs. W. C. Ladwign and Mrs. C. L. Duax.

The first speaker was Mr. H. W. Jones, President of our adjoining counties Lake-McHenry, who presented many interesting facts about honey production and marketing, all of which he handles himself. Mr. Jones winters his bees very successfully in a cellar and sells more honey than he can produce by his own method of roadside selling. Following are prices he was able to maintain through the season of 1933: 1-lb. jars, 20 cents; 2-lb. jars, 35 cents; 3-lb. jars, 50 cents; 5-lb. pails, 75 cents; 10-lb. pails, $1.35; comb honey, 20 cents a comb or three for 50 cents.

Mr. H. W. Jones has maintained a standard for his honey with the result that he finds that many orders for honey are mailed to him during the winter months.

Mr. Walter Scott Lohnes, Secretary of Tazewell County, gave us a very interesting and peppy talk on "Organization and What it Has Done for the Comb Honey Producers of Tazewell County." Tazewell County, being located in the clover belt, has found it more profitable to produce comb honey instead of extracted honey, and have adopted a uniform label to be used on all comb honey produced by its membership; each

member's pack being identified by a different letter of the alphabet. Only the best comb honey is marketed, the balance being melted. If any comb honey is not wrapped neat and is not up to standard, any member may purchase same from storekeeper at retail price to take it off the shelf, forward it to secretary, who in turn will return it to the original member as identified from label stamp, and this member must buy his own honey back at the retail price. This method has worked out well and has increased the price of honey considerably and also helped to eliminate competition with honey produced elsewhere and shipped in.

Mr. C. L. Duax gave a very interesting talk on "Inspection Work" relative to plans adopted for handling inspection work by the Department of Agriculture. It is planned to cover the entire State with twenty-seven inspectors. The fact that the force of inspectors was to be cut in two as the old force had approximately fifty inspectors, brought forth some discussion. Inspection work in Illinois was far from adequate with fifty or more inspectors on the old force and now, with only a neucleus of force for inspection work, fear was expressed that the beekeepers of Illinois are to lose considerably through increase of American foul brood.

With the reduced number of inspectors, who will draw less salary and expense money per day for traveling, and the appropriation for this work being cut but little over the previous two years, it seems as though the Department of Agriculture is planning to have each inspector work the entire year. Inspection work is seasonable and to be done to best advantage must be performed in approximately ten weeks' time, starting just after all danger of chilling brood is past and ending before supers are put on for surplus honey.

Entertainment was furnished by Lulu Belle of the WLS Barn Dance, and the two Gill boys, accompanied by Mrs. A. G. Gill.

June 16, 1934.

At our outdoor meeting of the Cook-DuPage Beekeepers' Association on June 16 we had a table full of honey cookies, cake and candy. Mrs. Irene W. Duax gave two pairs of Beeswax candles and a jar of Beeswax face cream for the best candy and cookies. Mrs. Chas. Siegel won first in the candy and Mrs. Frank Hofman won second. Mrs. Siegel also captured the prize for the best honey cookies. The judges were Mrs. Malitta Jensen of the American Honey Institute, Miss Anna McCormick, sister of the President of our Association, and Mrs. Vera Winkler of Joliet. We plan to have a hostess of the honey table.

MRS. ADAM BODENSCHATZ, *Hostess.*

July 21, 1934.

The second outdoor meeting of the Cook-DuPage Beekeepers' Association was held at Brother Frederick's apiary, Techny, Ill., on the grounds of the St. Mary's Mission House, July 21, 1934.

The meeting was called to order by the president, Mr. E. J. McCormick, at 2:45 o'clock p. m.

A committee was appointed by Mr. E. J. McCormick for the purpose of going back 100 years and telling us about how beekeeping was done then and on up to the present time. This is to be given at one of our winter meetings.

Mr. Duax made a motion to hold our next meeting at Palos Park, Illinois, August 11, 1934. It was seconded by Mr. Charles Siegle. Carried. Meeting adjourned and all partook of the picnic supper.

After the picnic supper Brother Frederick asked the beekeepers that wished to go and see his honey house and the ones that wished to go through the printing shop to form in two different groups, and then one of the other brothers conducted us through the printing shop, museum and chapel, and over the beautiful grounds, while Brother Frederick took the other group through his honey house and apiary.

There were sixty-five present.

August 11, 1934.

Our meeting of August 11, 1934 was held at the home of George Stebbings, Palos Park, Illinois. We had a table of honey bakings donated for the publicity department for the State Fair at Springfield, for display in the information booth and also given out as samples showing what delicious food can be made with Illinois Honey.

Another meeting was held at the home of Richard Meyers, South Holland, Illinois, on September 15, 1934. We had a very good lunch, some of the food being honey baked beans, honey fruit salad, honey macaroni, honey coffee cake, honey loaf cake, honey devils' food cake and honey apple pie.

Our next meeting will be held at the home of Chas. Siegle, Evergreen Park, Illinois, on October 27, 1934. All are asked to come in costume, as it is to be in the form of a hallowe'en party.

MRS. ADAM BODENSCHATZ, *Hostess.*

February 23, 1935.

The Cook-DuPage Beekeepers Association held their fifteenth Annual Business Meeting and Banquet at the Bismarck Hotel, located at Wells and Randolph Streets, Chicago, Illinois on February 23, 1935.

2:30 P. M.—Call to order.
Reading of minutes of last meeting.
Address by President, Mr. E. J. McCormick.
Appointment of Auditing Committee.
Secretary's report—Leroy Stockdale.
Treasurer's report—Leroy Stockdale.
Report from the five Vice Presidents.
3:30 P. M.—Advertising Committee report—Mrs. Irene Duax.
3:45 P. M.—Does the Honey Table Pay?—Mrs. Adam Bodenschatz.
4:00 P. M.—Beekeeping Fables Retold—Mr. C. W. Aeppler of Oconomowoc, Wisconsin.
5:00 P. M.—Beekeeping in Austria Hungary—Mr. A. Hrankay.
5:45 P. M.—Inspection for 1935—Mr. C. L. Duax.
6:00 P. M.—Banquet.

7:30 P. M.—Election of officers, and report of the Auditing Committee.
8:30 P. M.—To someone with something to say.
9:00 P. M.—Social side of beekeeping—Clara Siegel.
There was also a short musical program.

Henry County Beekeepers Association.
(Willis W. Drehmer.)

The annual meeting for 1933 was held in Cambridge on October 5, 1933 with nineteen persons present. Officers for 1934 then elected were: President, W. W. Drehmer; Vice President, Ed. Kommer; Secretary, Albert Knack and Ed. Van DeVoord. 370 pounds of wax was listed. The membership list was twenty. A field meeting was held September 12th, 1933 in Chautauqua Park, Kewanee, 60 present. The picture is shown herewith.

The annual meeting for 1934 was held in Cambridge on October 4, 1934 with twenty-one persons present. Mr. and Mrs. Duax were present and addressed the gathering. Officers elected: Ed. Kommer, President; Vice President Ed. Peterson; Secretary, Willis W. Drehmer; Treasurer, P. A. Carlson. Directors, Lawrence Peterson, Fred Ball and Elmer Kommer. Membership at this writing was twenty-five.

The County vigilance committee is: Jacob Wirth, Prophetstown; Ed. Kommer, Andover; Ed. Van DeVoord, Atkinson; Fred Ball, Kewanee; P. A. Carlson, Galva; Alfred Goedke, Kewanee; Geo. Florine, Bishop Hill; Elmer Kommer, Woodhull; Ed. Boberg, Cambridge; W. W. Drehmer, Osco; Ray Ott, Geneseo.

Logan County.
November 20, 1934.

A reorganization meeting was called for all Beekeepers in Logan, Mason and Menard Counties on November 20, 1934 for two purposes: to organize an association, and secondly to appoint on this date a vigilance under the supervision of C. L. Duax, chief apiary inspector.

The Beekeepers voted at this meeting that S. A. Tyler would serve as President and Vincent Peifer, Secretary and Treasurer for the coming year. After the election of officers, C. L. Duax gave the appointment on the vigilance committee; also Mr. Roche gave a talk on cut comb honey.

The second meeting was called on January 5, 1935. The business meeting was conducted in the usual manner, and new members were taken in.

LaSalle–Bureau.

Between October 11, 1934 and the end of the year the LaSalle and Bureau County Beekeepers' Association held three meetings, two at LaSalle and one at Ottawa, that latter being attended by Chief Inspector C. L. Duax. The first meeting netted nine members to the State Association. This number has been increased to seventeen. The

first meeting (October 11) was an afternoon session with exhibition hives on display. The second meeting was a late afternoon and early evening meeting. Lunches were served at both meetings. The meeting Mr. Duax attended was an afternoon meeting. At this meeting Mr. Duax announced that Putnam County would also be included in our association and Mr. Sylvester Legat of Spring Valley was named as candidate for bee inspection in the three counties. The appointment was confirmed December 1, 1934.

We feel that the latter part of 1934 saw our Association rise from a rather tottering, seemingly indifferent stage to an enthusiastic, progressive one. By frequent meetings and bulletins we are keeping our members Bee Association conscious and membership conscious. Our increased membership is an indication of the new life in the organization.

At a meeting January 5, 1935 we mapped out a program for 1935 that we feel we shall be proud to report at the end of the year.

Miss Rollean Entristle, *Sec.-Treas.*
LaSalle—Bureau County
Beekeepers Association.
109 Fourth St. LaSalle, Ill.

Jo Daviess County Meeting.

A very interesting meeting of the beekeepers of Jo Daviess, Stephenson, Carroll and Whiteside counties was held at the apiary of Chas. Handel in Savanna, Illinois, on September 30. A picnic dinner was served at noon, followed by a program consisting of talks, contests and other entertainment. The speakers included Chief Inspector Duax of Chicago, S. S. Claussen of Oregon, George Hartman of Freeport and also the chairman of the Ogle County Beekeepers' Association. Mrs. Irene Duax spoke to the women concerning the Honey Foods demonstration at the State Fair. She also judged the honey pumpkin pie contest, the prize being awarded to Mrs. Joseph Geiger, of Hanover. Mr. Eli Elieff of Galena won the smoker in the smoker contest, and Mr. Chas. Handel produced the best comb of honey and was therefore entitled to the Italian queen bee.

Four of the oldest beekeepers in this section of the State were present at this meeting. They were Lee Horning, Morrison; Herman Mehnleip, Warren; George Weed, Lanark, and Edward Jeffrey, Galena. Three of these men have kept bees over forty-five years and all are past the age of seventy.

The music for the program was furnished by Martha and Carlene Duerrstein.

At the close of the program refreshments consisting of honey pumpkin pie and honey cookies were served.

McHenry—Lake County Association Meeting.

The McHenry-Lake County Beekeepers' Association held their first meeting of the year Saturday, March 31, 1934, at Woodstock, Illinois

in the Farm Bureau office just north of the Court House, from 1 p. m., to 5 p. m.

Mr. J. R. Wooldridge, past assistant chief inspector of Cook County, talked on the subjects, "Beekeeping of the Past and Its Future Prospects," also "Lowering the Cost of Honey Production."

Some of the topics discussed were: Code and Package Bees, Marketing Association, Dues, Meeting, (how often), Contest for Reporting Neglected Apiaries and Prices.

The McHenry-Lake County Beekeepers' Association held a meeting on June 1, 1934, in the village hall at Mundelein, Illinois.

Mr. Duax, the Chief Inspector, gave a very interesting talk on inspection work and State Fair exhibits, and a short history of his start in beekeeping.

Prof. Bruce Lineburg of Lake Forest College showed a number of lantern slides he had photographed at the Experiment Station in Washington, D. C., while he was employed there a few years ago. They certainly were interesting and very educational.

The McHenry-Lake County Beekeepers' Association held a meeting on September 8, 1934, at Mr. Jones' residence in Cary, Illinois. Election of officers was held and the following were elected:

Mr. H. W. Jones, President; Mr. G. W. Mason, Vice President; C. P. Jankowski, Secretary-Treasurer.

After the business was carried out, the ladies served ice cream and cake.

Montgomery County.

(Bond and Fayette.)

Our first meeting this year was held March 29th, in the Circuit Court Room, at Hillsboro, Ill., from 7:30 to 9:30 p. m. Our president O. W. Kennett, of Ohlman, presided, and gave us a practical talk on A. F. B. and control measures. Mr. Kennett is particularly qualified to speak on this subject, as he had to combat it in his own apiary years ago, and won out. Having served as deputy inspector in our county since 1925, he is also thoroughly acquainted with our situation and needs. W. W. Osborn, Secretary, spoke on the American Honey Institute and its work, and the need for its support by all beekeepers, large and small. Last, and perhaps best of all, were honey-made refreshments, mince pie and cookies made with honey, and honey-lemonade, contributed by Mrs. Kennett and Mrs. Osborn. These were all "sunk without a trace".

Mr. Kennett called a meeting of Fayette County beekeepers May 26th, 2:00 p. m., at the apiary of Chas. Hage, in Vandalia, where an interested audience heard Mr. Kennett explain inspection work, with particular reference to eradication of A. F. B., W. W. Osborn again spoke on the need for the American Honey Institute and its work, after which we adjourned to the apiary for a practical demonstration of Mr. Kennett's apiary inspection.

A meeting for Bond County was called for June 15th, 7:30 p. m., in the Circuit Court Room, Greenville. In the absence of Mr. Kennett, W. W. Osborn presided, and led in the discussion of inspection work,

modern methods, and outlook for the future. The American Honey Institute was again discussed by Mr. Osborn. The absence of Mr. Kennett while regretted gave a chance for those present to speak their minds concerning his work as deputy inspector of apiaries, and it would have been fine if he could have been a little bird, and heard the nice things said about him. Not one single complaint!

Morgan–Scott County Meeting.

The business meeting of the Morgan-Scott Association was held the second week in January with a good attendance. Election of officers leaves the roster: Mr. T. B. Reese, President; Mr. W. G. Duckwall, Vice-President; Mr. Lawrence W. Fisher, Secretary-Treasurer.

Rock Island County Meeting.

The annual meeting of the Rock Island County Beekeepers Association was held at the home of Mr. and Mrs. John Mohr and Mike Mohr, September 27, 1934, with a potluck dinner to sixty members.

The following officers were elected: John Gasnow, Moline, President; Rev. C. K. Dean of Cordova, Vice-President; S. F. Peterson, E. Moline, Secretary; H. A. Wickersham of East Moline, Treasurer.

Directors: Fred Hofer of Taylor Ridge, Chas. King of Moline, and Clarence Schave of E. Moline.

C. L. Duax of Chicago, Inspector for Illinois, spoke about disease. Pierce Mohr of Bettendorf, Iowa, gave a very interesting talk on beekeeping from his boyhood to the present date.

S. F. Peterson,
2326 3rd Ave.,
E. Moline, Ill.

St. Clair Beekeepers' Association—1933.

The St. Clair Beekeepers' Association was organized in January. 1933, with the following officers: O. G. Rawson, 3208 Forest, East St. Louis, President; W. E. Frierdich, 1105 Bristow, Belleville, Illinois. Vice-President; Geo. Hankammer, Belleville, Illinois, Secretary and F. W. Peters, 727 Lebanon, Belleville, Illinois, Treasurer, with fifteen charter members.

The aims were to advance beekeeping and to help in every way possible the eradication of foul brood in this part of the State.

They recommended and were instrumental in having Mr. W. E. Frierdich, Belleville, Illinois, appointed a deputy bee inspector, the first one ever in this, St. Clair County.

It is incorporated in the rules and by-laws that there will be in each year, an automobile tour of beekeepers to the leading beekeepers of the territory. A fall picnic at some central point, easily reached by all interested and a honey exhibit and honey cooking school.

The 1933 tour was held June 17, there being seventy-five beekeepers present and visited Wm. Hubert, Belleville; J. W. Klein, Freeburg; Jas. A. Farmer, Freeburg; Hy J. Hummert, Fayetteville; Philip Krebs, Marissa; J. H. Keiner, New Athens; Earl Schlisinger, Belleville.

The picnic was held at the summer home of Jas. A. Farmer at Freeburg. One hundred beekeepers and their friends attended. After the lunch and walks around the hills, there was a very interesting talk, by Mr. C. A. Mackelden, State President on the need for more stringent laws governing bee diseases; also a talk by Mr. G. H. Cale, Hamilton, Illinois on the use carbolic acid in driving bees from the super.

In cooperation with National Honey Week the Annual Honey Exhibit was held, also cooking school, and the demonstration of the use of honey in cooking and baking. There were twelve hundred visitors.

At the December meeting there was a membership drive, at which time the motion picture "The Realm of the Honeybee" was shown to two hundred beekeepers and friends, and the year ended with thirty-five members.

O. G. Rawson, *President.*

St. Clair Beekeepers' Association—1934.

Officers for the year, O. G. Rawson, East St. Louis, Illinois, President; W. E. Frierdich, Vice-President; Geo. Hankammer, Secretary; F. W. Peters, Belleville, Illinois, Treasurer.

January meeting, motion pictures were shown on beekeeping and equipment manufacture. At this meeting it was decided by the association that we concentrate more on advertising of honey, and also try to establish a uniform price for honey.

February meeting there was shown motion pictures of bee diseases and their modern treatment.

From April 14th to 17th in cooperation with the Belleville Advocate, the Association held a cooking school in the leading theatre building, in which the uses of honey in cooking was demonstrated and honey advertising matter, also honey receipts were handed out. There was an average of 1,500 visitors daily. There was a decided greater demand for honey after this meeting.

In June the regular yearly tour was held. Visiting Wm. Hubert, Belleville, where there was a demonstration of modern queen rearing and introducing. Next J. W. Klein, Freeburg, for a demonstration of transferring bees from a decoy hive to a modern one. Mr. Jas. A. Farmer, Freeburg, where we had the proper manipulation of modern bee equipment. Philip Krebs, Marissa for honey extracting, and wax rendering. Next Val Heil, Marissa, for a demonstration of driving bees from diseased combs by the carbolic acid method and then to Hy. J. Hummert, Fayetteville, to inspect bees after having been treated for foul brood.

The regular picnic was held on September 18th, at the home of F. G. Oexner, Waterloo, Illinois. The speakers for the day were M. G. Dadant, on Honey Markets; L. C. Dadant, on Bee Feeding; F. C. Pellett, on the Place to Keep Bees; Mr. C. D. Duax, on Bee Inspection; Mrs. Irene

Duax, on Advertising; C. A. Mackeldon, on Beekeepers Associations, and several deputy inspectors on Condition of Bees Throughout the State.

The regular annual cooking school and honey exhibit was held in cooperation with National Honey Week, in the show rooms of the Illinois Light and Power Company. Mrs. Emma Peters acting as honey hostess. During the week 12,000 Kellog leaflets and 1,000 leaflets of the Illinois Honey Foundation were given out. A honey baking contest and sale was held, which netted the Association a substantial sum. The Association is affiliated with The American Honey Institute, and the Illinois Beekeepers Association.

The St. Clair Association meets every third Friday of the month in the Highway Building, Belleville, Illinois, and all beekeepers and friends are welcome. The year ended with fifty-five members.

Saline and Gallatin Meeting—1933.

The first bee meeting was held at Harrisburg, April 1, 1933, with 10 present. A meeting was also held at the home of Ray Micks, Eldorado, Illinois. On June 17, 1933, we met again at Louis Vannis' Apiary, Harrisburg, Illinois. Three more meetings were held at the homes of Ellis Harper in July, Alvin Bell's in August, and Victor Lamandin, Eldorado, in September. For the year 1933 we had fourteen members in our association.

April 14, 1934, we met at George Lusk's home. We had a large crowd present, and received some interesting information from Mr. Duax, chief inspector. The officers elected were: President Louis Vannis, Vice-President Rex Stricklin, Secretary Alvin Bell, Ridgway, Illinois.

A motion was made that we send five dollars ($5.00) to the American Honey Institute.

Mr. John Schmitt of Ridgway, Illinois, was the host to a meeting held there on May 19th, with ten present. Inspector Duax examined his hives, and found only one case of foulbrood.

For the year 1934 we had seven members in our Association. Bees did fine in early spring and summer. However, the bees did not do much after the first of September, and we had no late honey flow at all.

Stark County Meeting.

A meeting of the Stark County Beekeepers was held at Elmira, Illinois, on December 28, 1933, with Mr. C. N. Gerard of Elmira, president presiding.

Elmer Kommer, inspector was present and gave a talk on Bee Diseases Wintering and Honey Production.

Everett Price, Toulon, Illinois, secretary of the Association gave a very interesting report of the activities of the Association and the cooperation given the inspector so that a complete report on all beekeepers in Stark County could be had.

Another meeting is planned in the near future when officers will be elected and the contribution to the State Honey Advertising Committee will be considered.

Tri–County Beekeepers Association.

(Elizabeth Ordnung, Secretary.)

The Tri-County Beekeepers Association held only one meeting in 1933, and that was the annual meeting which is always held on the third Wednesday in September. We had two meetings in 1934; a field meeting on May 28th at Geo. Sauers' Apiary in Polo, and an all day indoor meeting September 19th at the Oregon Coliseum. Chief Inspector C. L. Duax attended both meetings in 1934. Robert Gober of Oregon is our president.

Will–Grundy–Kendall Counties.

April 2, 1933.

President—George W. Lynn.
Vice-President—Axel Johnson.
Secretary and Treasurer—Theo. Wellner.

On April 2, 1933, a meeting was held at the home of Mr. T. Wellner at Joliet, which was well attended. It was decided that each member should write to the senators: Mr. Michael Hennebry of Wilmington, John L. Walker of Joliet, Lottie Holman O'Neil of Downers Grove, and Richard J. Barr of Joliet, their object to get a better appropriation for the inspector of bees.

It was also decided that each member should inspect his own bees very carefully, and to help his neighbor beekeeper.

On July 16, 1933, a picnic and meeting was held at the home of Frank Zupancic at Sherwood Beach. Mr. Duax from Chicago gave an instructive talk of the bee industry. A good time was had by all.

November 1933, a meeting was held at the home of Mr. Wellner of Joliet, only members attended. Talks were given and it was decided that the price on honey should be held more uniform.

Mr. Duax gave a talk on inspection work, and the State convention at Springfield, November 16-17. 1933 was a poor honey year for the beekeepers of Will county.

Will–Grundy–Kendall County Association—1934.

(Elmer Luebeck, Elwood, Illinois—Secretary.)

On April 8, 1934, a meeting for the election of officers was held at the home of Mr. Lynn at Lockport. President Geo. Lynn, Lockport, Illinois; First Vice-President Axell Johnson, Will County; First Vice-President Wm. Osborn, Grundy County; Secretary and Treasurer Elmer Luebeck, Elwood.

A fine lunch was served by Mrs. Lynn.

On May 27, 1934, a picnic and meeting was held on the Island at Wilmington. The name of the Association was changed from Will County Beekeepers Association to Will-Grundy-Kendall County Association, by the majority of votes. A cookie contest was held.

July 15, a picnic and meeting was held at Gould Park, Morris, Illinois. Prizes were given for the best honey spice cake. Lunch and the prize cakes were served. Some of the beekeepers visited Mr. Anderson's apiary. He showed how he cleans hives and frames.

Mr. Anderson had a nice display of relics and many things of interest. This meeting was well attended and all had a good time. It was agreed to have our annual meeting at the home of Mr. Lynn at Lockport, September 15th, which was postponed due to the sickness of Mrs. Lynn.

1934 was a fair honey year. Beekeepers are more cheerful and hopeful for a better price for honey in 1935.

February 3, 1934, Will County Association held a splendid meeting with dandy attendance and best of all a good "pass the hat" contribution to the State advertising fund.

Chief Inspector Duax was the principal speaker, and after the meeting everyone enjoyed coffee and food and lots of discussion.

The monthly meeting of the Winn County Beekeepers Association was held December 19, 1934, in the auditorium of the Gas Electric building. The meeting was called to order by the Vice President, Mr. Ray Husen, who presented Jack Raymond's orchestra of 12 pieces playing three numbers. Mr. Gober of Oregon then gave a report on the State meeting. Mr. Claussen, Deputy Inspector, then spoke on "Winter Packing", Mrs. Alma Hunt of Radio Station WROK was then called upon and she in turn introduced the principle speaker of the evening, her chief, Mr. Lloyd Thomas owner of the Station. Mr. Thomas gave a very interesting talk on Radio and its Relation to Advertising. Mr. Thomas had been with NBC for ten years before coming to Rockford and is surely well informed and well qualified to speak on such a subject.

The wives of the members were present and served a dainty lunch consisting of Honey Gingerbread with whipped cream and coffee. Mr. Raymond's players then entertained again followed by the "Hill Billies" who made things lively until a late hour. On adjournment every one departed with pleasant memories of an enjoyable as well as a profitable evening.

Will County Meeting.

The Will County Beekeepers' Association and their families met at the home of B. E. Beach on Sunday, August 5, for an all day meeting. After a social session and potluck dinner speeches were given by Mrs. C. L. Duax, Mr. Duax, Mr. A. C. Norris and Mr. S. S. Claussen.

Mrs. Duax tested foodstuffs made by the ladies containing honey and awarded the prize—Mrs. C. L. Ripple winning the prize with a pumpkin pie.

A demonstration of the use of the Carbolic Screen was given by Mr. Beach, who also invited all to inspect his honey house where he gave a demonstration of uncapping and extracting honey.

Mr. Art Green received the Caucasian Queen, the prize for the best comb of honey.

Steps were taken for a woman's auxiliary and the following ladies were appointed to further the cause: Honey Hostess—Mrs. L. M. Stutsman; Refreshment Committee—Mrs. B. E. Beach, Mrs. Ray Husen, Mrs. Clara Wolford.

We are doing all we can to strengthen our Association and by getting the women interested hope to do still more.

Yours sincerely,

B. E. Beach.

Meeting of Vermilion County Beekeepers Association.

A meeting was held for the purpose of electing a new president as Mr. Richards, the former president is moving out of the county. Mr. Alfred P. Johnson was elected President and Mr. W. R. Shure Vice President, Mr. F. W. Morrison remaining as Secretary and Treasurer. It was an open meeting and eleven new members were taken in.

STATE INSPECTOR OF APIARIES.

AN ACT to prevent the introduction and spread in Illinois of foulbrood among bees, providing for the appointment of a State inspector of apiaries and prescribing his powers and duties. (Approved June 7, 1911. L. 1911, p. 4.)

123. 1. Repealed. Act approved July 8, 1931. L. 1931. p. 1.

124. FOULBROOD AMONG BEES A NUISANCE—INSPECTION—ABATEMENT OF.] 2. It shall be the duty of every person maintaining or keeping any colony or colonies of bees to keep the same free from the disease known as foulbrood and from every contagious and infectious disease among bees. All bee-hives, bee fixtures or appurtenances where foulbrood or other contagious or infectious diseases among bees exists, are hereby declared to be nuisances to be abated as hereinafter prescribed. If the inspector of apiaries* shall have reason to believe that any apariary is infected by foulbrood or other contagious disease, he shall have power to inspect, or cause to be inspected, from time to time, such apiary, and for the purpose of such inspection he, or his assistants, are authorized during reasonable business hours to enter into or upon any farm or premises, or other building or place used for the purpose of propagating or nurturing bees. If said inspector of apiaries, or his assistants, shall find by inspection that any person, firm or corporation is maintaining a nuisance as described in this section, he shall notify in writing the owner or occupant of the premises containing the nuisance so disclosed of the fact that such nuisance exists. He shall include in such notice a statement of the conditions constituting such nuisance, and order that the same be abated within a specified time and a direction, written or printed, pointing out the methods, which shall be taken to abate the same. Such notice and order may be served personally or by depositing the same in the postoffice properly stamped, addressed to the owner or occupant of the land or premises upon which such nuisance exists, and the direction for treatment may consist of a printed circular, bulletin or report of the inspector of apiaries, or an extract from same.

If the person so notified shall refuse or fail to abate said nuisance in the manner and in the time prescribed in said notice, the inspector of apiaries may cause such nuisance to be abated, and he shall certify to the owner or person in charge of the premises the cost of the abatement and if not paid to him within sixty days thereafter the same may be recovered, together with the cost of action, before any court in the State having competent jurisdiction.

In case notice and order served as aforesaid shall direct that any bees, hives, bee fixtures or appurtenances shall be destroyed and the

* Office of State Inspector of Apiaries is abolished and powers of and duties transferred to Department of Agriculture. Chap. 127, Pr. 35, 40.

owner of such bees, hives, bee fixtures or appurtenances shall consider himself aggrieved by said order, he shall have the privilege of appealing within three days of the receipt of the notice to the County Court of the county in which such property is situated. The appeal shall be made in like manner as appeals are taken to the County Court from judgments of justices of the peace. Written notice of said appeal served by mail upon the inspector of apiaries shall operate to stay all proceedings until the decision of the County Court, which may, after investigating the matter, reverse, modify or affirm the order of the inspector of apiaries. Such decision shall then become the order of the inspector of apiaries, who shall serve the same as hereinbefore set forth and shall fix a time within which such decision must be carried out.

124a. TRANSPORTATION OF BEES FROM ONE COUNTY TO ANOTHER.] Pr. 2a. No person shall transport a colony of bees or used bee equipment, except a live queen and her attendant bees in a cage without comb or brood, from one county of this State to another county in this State, without a certificate from the Department of Agriculture, stating that it has, within sixty days before the date of shipment, inspected the colony or equipment and found it to be free from foulbrood. (Added by Act approved July 8, 1927. L. 1927, p. 34.)

124b. TRANSPORTATION OF BEES INTO THIS STATE.] Pr. 2b. No person shall transport a colony of bees or used bee equipment except a live queen and her attendant bees in a cage without comb or brood, into this State from a state or country having an inspector of apiaries or other officer charged with similar duties, without a certificate stating that the officer has, within sixty days before the date of shipment, inspected the colony or equipment and found it to be free from foulbrood.

No person shall transport a colony of bees or used bee equipment, except a live queen and her attendant bees in a cage without comb or brood into this State from a state not having an inspector of apiaries or other officer charged with similar duties, unless the shipper or consignee has obtained from the Department of Agriculture, upon making a sufficient showing that the colony or equipment is free from foulbrood, a permit for the shipment into the State. (Added by Act approved July 8. 1927. L. 1927, p. 34.)

125. REPORT.] Pr. 3. The inspector of apiaries shall, on or before the second Monday in December of each calendar year, make a report to the Governor and also the Illinois State Bee Keepers' Association, stating the number of apiaries visited, the number of those diseased and treated, the number of colonies of bees destroyed and the expense incurred in the performance of his duties.

126. PENALTY FOR SELLING DISEASED APIARY.] Pr. 4. Any owner of a diseased apiary or appliances taken therefrom, who shall sell, barter or give away any such apiary, appliance, queens or bees from such apiary, expose other bees to the danger of contracting such disease, or refuse to allow the Department of Agriculture to inspect such apiary or appliances, and any person who shall violate the provisions of Section 2a or Section 2b of this Act, shall be fined not more than $100.00. (As amended by Act approved July 8, 1927, L. 1927, p. 34.)

ANNUAL REPORT OF THE CHIEF INSPECTOR OF APIARIES FOR THE BEEKEEPING YEAR STARTING APRIL 1, AND ENDING OCTOBER 20, 1934.

(C. L. Duax, 3414 S. Western Ave., Chicago.)

Hon. Governor Henry Horner, State of Illinois:

DEAR SIR: It is with pleasure I submit the following report for the work completed by the inspection force:

In order to have inspection in each county with a fewer number of inspectors, it was decided to unite the 102 counties of the State into 28 districts. In each district there are from two to nine counties. There was appointed a deputy inspector in each district and instructions were given him to do an equal amount of work in each county provided there was about the same number of bees in each of these counties.

During the past season the deputy inspectors were required to turn in weekly reports instead of monthly reports. This was an advantage because I was able to get my reports out on time, and enabled me to keep a closer check on the deputy inspector's work.

Instructions for the coming year will be that the inspector make a lagiole mark on the hive, putting down the letters O. K. if the colony is healthy and if diseased naming the disease: A. F. B., E. F. B., Sac or Pickle Brood, also the date when inspected.

Another important plan that I am following out is the appointing of a Vigilance Committee in each of the twenty-eight districts. Each district is allowed 15 or more men on the committee. They will be selected from the men who have helped the deputy inspector during the past season. By this plan I hope to get in closer contact with the beekeepers. Some of the appointments on the Vigilance Committee have been made in Districts 1, 2, 8, 9, 11, 19, 28.

This plan has the approval of the Department of Agriculture and the State Beekeepers' Association and so far the beekeepers are accepting it with great favor. During the next few months I hope that I can make the rest of the appointments in the State.

Conforming to a budget the appropriation funds were divided equally among the districts of the State, allowing each deputy inspector a definite number of days work for the season. This method was greatly appreciated by the deputy inspectors and they arranged their work so that most of them worked all of the days allotted them.

The following are the totals for the amount of work done in each district during the season:

C. L. DUAX,
Chief Inspector of Apiaries.

District	No. of colonies	No. Examined	Diseased	Destroyed	Treated
1	5,004	4,204	397	320	77
2	4,578	4,578	561	553	8
3	5,000	3,560	752	337	415
4	3,391	2,423	151	122	29
5	5,970	5,970	382	52	267
6	6,720	5,670	678	282	396
7	3,267	3,267	1,105	...	...
8	1,943	1,943	167	85	82
9	2,535	2,096	335	205	130
10	3,441	3,441	857	451	406
11	363	363	72	54	18
12	2,141	2,019	267	...	267
13	1,506	1,506	252	71	181
14	4,788	4,354	475	212	263
15	3,358	2,978	498	244	254
16	3,962	3,077	873	571	302
17	3,097	2,577	419	112	307
18	4,124	4,017	264	...	264
19	3,975	3,813	316	185	131
20	1,038	617	302	...	...
21	4,706	4,706	81	70	11
22	2,165	1,764	553	24	8
23	3,481	2,896	331	155	176
24	3,936	3,333	219	81	138
25	4,656	4,150	307	56	60
26	4,096	3,764	695	650	45
27	5,136	5,136	163	163	...
28	2,796	2,796	104	24	42

Following are the reports of the Inspectors from the twenty-eight districts:

C. L. DUAX.

ANNUAL REPORT OF DISTRICT 1.

(Composed of Jo Daviess, Stephenson, Carroll, and Whiteside Counties.)

During the inspection season of 1934, beginning April 9th and ending October 20th, I visited 348 apiaries with a total of 5004 colonies in the four counties. I examined 4204 colonies and have found 397 colonies to be diseased with American foul brood, of these, 77 colonies were treated and 320 colonies burned either by owner or myself.

Two meetings of the beekeepers of this district were held this summer. The first meeting was held on June 4th at the home of Levi Moirssee at Stockton. At this time a new association was organized and much interest was shown in regard to the new program for inspection explained by Chief Inspector C. L. Duax. The areas of infection in this district were discussed and maps were shown of these areas.

Another meeting was held at the apiary of Charles Handel in Savanna on September 30th. This was a most successful meeting, the attendance being much larger than that of the first meeting. Interesting talks were given by S. S. Claussen, Deputy Inspector from Oregon; C. L. Duax, and Mrs. Irene Duax of Chicago; Mr. Geo. Hartman of Freeport brought a comb of American foul brood and this was shown to the beekeepers.

C. W. DUERRSTEIN, Galena.

Annual Report District 2.

(Composed of Ogle, Lee and Winnebago Counties.)

Total number of colonies examined	4,578
Total number of colonies diseased	561
Total number of colonies burned	535
Total number of colonies treated	8
Total number of beekeepers meetings attended	6

Talks were given at all meetings attended on disease control, How to Detect American Foul Brood, and How to Produce the most Honey.

Most of the inspection work was done in the small bee yards.

S. S. Claussen, Oregon.

District No. 3.

(Lake-McHenry-Boone Counties.)

During the year of 1934, I commenced working on the 29th of April and closing my work on the 20th of October. I have the following report to offer:

There are approximately 350 apiaries in my district which consist of about 5,000 colonies. Due to the insufficient time that was allotted to me, I was able to visit only 310 apiaries. In these 310 apiaries, I examined 3,560 colonies of which 752 were affected with American foulbrood.

Of these 752 diseased colonies, I burned 337 myself and the remaining 415 were either burned by the owners or treated by the shaking method.

Due to the drought this year, the bees were more susceptible to contract the disease since they consumed most of the honey that was stored for a long number of years and which might have been contaminated.

In attending the three beekeepers' meetings in the past summer, I have found them to be very educational to myself and especially to the beekeepers. If a difficult problem confronts the beekeeper, he can bring it to one of these meetings where it will be solved for him. The inspectors are always busy at these meetings giving detailed information in regard to treating or shaking diseased colonies and to other disorders that may arise.

One of the greatest problems that the inspectors have to confront is the bees in the houses, trees and old barns.

What can be done with bees that can not be examined?

C. P. Jankowski.

District No. 4.

(Kane and DeKalb Counties.)

Total number of colonies	3,391
Total number of colonies examined	2,423
Total number of colonies diseased	151
Total number of colonies treated	29
Total number of colonies burned	122

Ross R. Morrill, *Inspector.*

I attended four Cook-DuPage Beekeepers' Association meetings during the season, which brought me in contact with a number of new beekeepers seeking help and also offering their assistance in locating all bees in their territory.

The meetings were also a benefit through the efforts of our advertising chairman, Mrs. Duax, in stabilizing the prices of honey and the many new uses of honey brought before the public.

CHICAGO, ILL., *October 20, 1934.*

Mr. C. L. Duax, Chief Inspector of Apiaries, Chicago, Ill.

DEAR MR. DUAX: Reviewing the last year's work of inspection in Cook County, the work began May 1st, continuing until October 20th, 1934. During this time I visited 286 apiaries containing 2,883 colonies of which 135 colonies were found to be diseased with A. F. B.; 15 colonies were treated successfully, 120 being disposed of by the owner or myself by fire.

This caused a loss of approximately 1,800 frames as many colonies had one or more supers that were all destroyed.

We have something to look forward to in the future, relative to the spread of the disease as all old honey in the hives was almost completely exhausted and if diseased, it showed in the brood of the colony soon after and detected by the beekeeper or inspector before getting much of a start and taken care of promptly, preventing the danger of spreading.

With the cooperation of the beekeepers which seems to be increasing each year, Cook County should be made clean of A. F. B. in the near future.

Yours truly,

J. R. WOOLDRIDGE.
1021 West 70th St., Chicago, Ill.

YEARLY REPORT OF DEPUTY WM. J. WALLANCHES OF DOWNERS GROVE.

DISTRICT NO. 5.
(Composed of two counties, DuPage and Cook.)

Total number of colonies examined	1,766
Total number of diseased colonies	219
Total number of colonies treated	48
Total number of colonies burned	115

I have attended two of the beekeepers' association meetings, and found them very interesting and educational regarding inspection work. I learned a bit myself, through the different discussions taking place, and by getting acquainted with other inspectors and exchanging different ideas. I also think these meetings are of a special value to the new and also old beekeepers who always learn something new about beekeeping and the different diseases especially American Foulbrood and learn how to check the disease. The new beekeepers also get to know who their inspector is and he in turn learns of their whereabouts, etc.

Yours very truly,

WILLIAM J. WALLANCHES.

Annual Report of District No. 6.
(Composed of Will, Kendall and Grundy Counties.)

Total number of colonies examined	5,670
Total number of colonies diseased	678
Total number of colonies burned	282
Total number of colonies treated	396

I attended four meetings of the association at which time inspection was a topic. The first, about closing up dead colonies, and if found to be diseased, disposal of the same to prevent robbing, which is the principle cause of spreading American foulbrood.

Theodore Wellner, Joliet.

Annual Report of District No. 8.
(Composed of Henry, Knox and Stark Counties.)

Total number of colonies examined	1,943
Total number of colonies diseased	167
Total number of colonies burned	85
Total number of colonies treated	82

Elmer Kommer, Woodhull.

Annual Report of District No. 9.
(Composed of Rock Island, Mercer, Henderson and Warren Counties.)

Total number of colonies examined	2,096
Total number of colonies diseased	335
Total number of colonies burned	205
Total number of colonies treated	130

Attended three county meetings, one each in Mercer, Rock Island and Henry Counties.

Dow Ripley, Taylor Ridge.

Hamilton, Ill., *October 16, 1934.*

C. L. Duax, Chief Inspector, 3414 S. Western Ave., Chicago, Ill.

Dear Sir: Herewith is the report for District No. 10, Hancock, Adams and McDonough counties:

Number of colonies in District No. 10	3,441
Number of diseased colonies in District No. 10	857
Number of colonies treated in District No. 10	406
Number of colonies burned in District No. 10	451

The majority of colonies were inspected twice during the season. I found many beekeepers antagonistic toward inspectors, and I have attempted first of all, to gain the good will of the majority of them. In so doing, perhaps I have been too lenient with some. I also considered finances and crop conditions when dealing with them, by extending time until they were able to purchase new material.

I mailed out two circular letters to the beekeepers of my district during the season, urging them to keep their bees clean, and to learn more about bee diseases. I also had government bulletins on bee dis-

eases and other bee subjects, mailed to 285 of the beekeepers of my district.

Two meetings were held in this district during the season, the first one being a meeting of the Hancock County Association, which was poorly attended. The second meeting was a district meeting, and was attended by forty-five beekeepers. Instructive talks were given by Chief Duax, C. P. Dadant and others. I believe that the chief benefit of these meetings is in getting the support of those attending in inspection work. Many who attended these meetings were a great help to me in the field. The ones who need instruction do not attend meetings.

This being my first season at State inspection work, I am conscience of many mistakes that only experience can correct.

Very truly yours,

HARRY F. LEPLAR, *Deputy District No. 10.*

ANNUAL REPORT OF DISTRICT NO. 12.

(Composed of three counties, namely, Logan, Mason and Menard.)

Total number of colonies in District No. 12	1,740
Total number of colonies examined in District No. 12	1,618
Total number of diseased colonies in District No. 12	105
Total number of colonies treated in District No. 12	105
Total number of colonies burned in District No. 12	48

Yours very truly,

VINCENT PEIFER.

ROANOKE, ILL., *October 19, 1934.*

District No. 13 is composed of Woodford, Livingston and McLean counties.

There probably are approximately four or five thousand colonies in this district.

Number examined	1,506
Number diseased	252
Number treated	181
Number burned	36

Respectfully yours,

BENJ. H. FISCHER.

ANNUAL REPORT OF DISTRICT NO. 14.

(Composed of Iroquois, Kankakee and Ford Counties.)

Total number of colonies examined	4,354
Total number of colonies diseased	475
Total number of colonies burned	212
Total number of colonies treated	263

Attended one association meeting of Iroquois, Ford and Kankakee counties.

J. N. KORITZ, Buckley.

Annual Report of District No. 15.

(Composed of Champaign, Douglas and Vermilion Counties.)

This is my report for the year 1934, beginning work the 11th day of July, working 34 days, visited 244 apiaries, examined 1,445 colonies, finding 355 diseased, 351 American foulbrood and 4 European foulbrood and some sac brood; 244 were burned, and 111 were treated. Most of my work was in territory that had never been inspected. There has never been a beekeepers' meeting in my district since I have been inspector, but I think there should be.

Herman Denhart, St. Joseph.

Annual Report of District No. 16.

(Composed of DeWitt, Macon, Piatt and Moultrie Counties.)

Following is my report for District No. 16:

Total number of colonies examined	3,962
Total number of colonies diseased	873
Total number of colonies burned	571
Total number of colonies treated	302

Special meetings were called in Macon, Piatt and Moultrie counties for the purpose of instructing the beekeepers in recognizing and treating A. F. B. The associations of both Macon and Piatt counties were a great help to me by giving me names of beekeepers and helping in every way possible to locate diseased colonies.

C. W. Mussulman, Hammond.

Annual Report of District No. 17.

(Composed of Brown, Schuyler, Cass, Morgan and Scott Counties.)

Total number of colonies examined	2,577
Total number of colonies diseased	419
Total number of colonies burned	112
Total number of colonies treated	307

I have attended about four or five meetings and found them quite a help in finding the diseased areas.

Leonard Robins, Ripley.

Annual Report of District No. 18.

(Composed of Jersey, Greene, Pike, Macoupin and Calhoun Counties.)

Total number of colonies examined	4,017
Total number of colonies diseased	264
Total number of colonies treated	264

C. A. Mackelden, Jerseyville.

Annual Report of District No. 19.

(Composed of Christian and Shelby Counties.)

Total number of colonies examined	3,813
Total number of colonies diseased	316
Total number of colonies burned	185
Total number of colonies treated	131

Harry King, Springfield.

Annual Report of District No. 21.

(Composed of Crawford, Jasper, Effingham, Clay, Wayne, Edwards, Wabash, Lawrence and Richland Counties.)

Total number of colonies examined	4,706
Total number of colonies diseased	81
Total number of colonies burned	70
Total number of colonies treated	11

I attended five county fairs with a bee exhibit. The exhibits received much favorable comment.

John Skinner, *Assistant Chief Inspector*, Albion.

Annual Report of District No. 22.

(Composed of Montgomery, Bond and Fayette Counties.)

Total number of colonies examined	325
Total number of colonies diseased	27
Total number of colonies burned	24
Total number of colonies treated	3

I found nearly all the places visited that the folks were glad to have their apiaries inspected and tried to cooperate in every way possible.

Geo. H. Hill, Hillsboro.

Annual Report of District No. 23.

(Composed of Madison, St. Clair and Monroe Counties.)

Total number of colonies examined	2,896
Total number of colonies diseased	331
Total number of colonies burned	155
Total number of colonies treated	176

The season was very unfavorable for inspection work, the fore part was cold and the latter part hot and dry, causing the bees to rob five months out of the six. The disease is well under control and with a little more cooperation it can be kept that way.

District No. 24.

1409 Forest Ave., Mt. Vernon, Ill.

Dear Mr. Duax: The following is my year's report:

District No. 24 is composed of four counties, namely, Jefferson, Marion, Clinton and Washington counties.

Total number of colonies in District No. 24..... 3,936
Total number of colonies examined in District No. 24..... 3,333
Total number of colonies diseased in District No. 24..... 219
Total number of colonies treated in District No. 24..... 81
Total number of colonies burned in District No. 24..... 138

I attended four meetings in District No. 24 and one in District No. 23. I am sure that the beekeeping industry has been benefited from them. They have encouraged both experienced and inexperienced beekeepers.

We must have the association meetings as closely connected as possible with the inspection work of the State. An inspector cannot do a good work unless he has cooperation from all the beekeepers. The meetings give the inspector a chance to secure this cooperation and secure the help of enthusiastic beekeepers in finding the uninterested and careless beekeepers.

Yours truly,

REGINALD BEAN.

ANNUAL REPORT OF DISTRICT NO. 25.

(Composed of Franklin, Jackson, Randolph and Perry Counties.)

Total number of colonies examined 4,150
Total number of colonies diseased 307
Total number of colonies burned 56
Total number of colonies treated 60
Total number of box hives 1,282

I attended the beekeepers' meetings and I think they are very valuable as they educate the beekeepers as to the danger of American foulbrood.

ROY BAXLEY, Christopher.

ANNUAL REPORT OF DISTRICT NO. 26.

(Composed of Hamilton, White, Gallatin, Saline, Pope and Hardin Counties.)

Total number of colonies examined 3,764
Total number of colonies diseased 695
Total number of colonies burned 650
Total number of colonies treated 45
Total number of box hives..... 2,825

ORA LEE FUNKHOUSER, Eldorado.

INSPECTOR'S REPORT, DISTRICT NO. 27.

District No. 27, consisting of Williamson, Union, Johnston, Massac, Pulaski and Alexander counties.

Number of colonies examined 5,136
Number of colonies diseased 163
Number of colonies burned 163

We did not treat any colonies since burning is the surest way of getting rid of the disease.

Two meetings were held, but they were not associational meetings since we were unorganized. These meetings were well attended. At them there was much discussion concerning the profits derived from standard equipment and inspection. This was a fair year for honey in these sections.

A. J. PHILLIPS, *Deputy Inspector,*
1203 Borham Avenue, Johnston City, Illinois.

DISTRICT NO. 28.

PEKIN, ILL., *October 16, 1934.*

C. L. Duax, Chief Inspector.

DEAR SIR: I herewith hand you a report of which I am personally proud of and feel that the 476 beekeepers I had the pleasure of meeting and going through their 2,796 hives of which I found 104 diseased as follows: 28 European foulbrood, 76 American foulbrood, 24 were burned by myself, the balance were taken care or by the owners. Are well pleased also.

I wish to state I was in localities where they had never heard of inspection, and found American foulbrood in the apiaries of two former inspectors who complied with my request to burn.

In McLean County I find most of the American foulbrood and some careless beekeepers.

Their county association is not or was not going so good while I was in this territory.

I gave a lecture on American and European foulbrood and furnished film strip which was shown at Green Valley, Ill., Pekin, Ill., and at the Pekin High School agricultural class.

I attended 25 association meetings and also the Demouth Memorial meeting for four days. I find these meetings helpful to all who attend and gives the inspector a chance to locate new beekeepers.

The Tazewell County Association held a July 4 open air meeting at Hopedale, Ill., at which our chief inspector attended. It was largely attended by beekeepers from everywhere and the association has had numerous requests for more of these meetings. The above report is from District No. 12, composed of Tazewell County and McLean County.

Summary: 2,796 colonies examined; 104 diseased; 24 burned; 42 treated; 101 box-keg-washing machine-butter church hives.

WALTER SCOTT LOHNES.

AMERICAN HONEY INSTITUTE.

Mrs. Jensen in her talk at the Mid-West Horticultural Exposition presented the following analyses of the work of the American Honey Institute.

What Is American Honey Institute?

It is an educational trade association organized for the purpose of improving the beekeeping industry by creating a *Greater Demand For Honey.*

It operates through a ntional and local good-will contact program. Such a program develops interest in honey to the extent that increased consumption results. The Institute sends to food specialists facts concerning the nutritional value of honey as well as practical recipes for its use. There specialists, who are influencing the daily eating habits of the American people, incorporate in their food releases, advertising, and radio programs these honey facts.

In addition, suggestions for club programs, school projects, demonstration outlines, marketing ideas, home and quantitative recipes are furnished to teachers, institutions, homemakers and producers everywhere.

Because of this new interest in honey, American Honey Institute is rapidly becoming a clearing house for all information on honey. Further research in uses for honey has also been stimulated.

Does The Institute Buy or Sell Honey?

It does not! It does, however, advertise its own members by including a copy of the Honor Roll in every set of material sent out.

How Is Membership Determined?

There is no set membership fee. One Dollar per ton for each ton of honey produced is suggested as the determining basis for membership. One may send money direct to the Institute or honey to his nearest Receiver. The Receiver sends the money from the sale of the honey direct to the Institute and the individual is given membership credit.

That practice is not entirely satisfactory. Express charges have to be deducted from the sale price which materially reduces the membership. Prices of honey differ in various localities. Many times the listing of a beekeeper's name on the Honor Roll is delayed because the Receiver cannot dispose of the honey immediately. Unless the beekeeper understands these difficulties, there may be a misunderstanding.

What Is It's Service To Members?

The Institute is contacting the public every day in one way or another. The printed evidence of the honey publicity secured the past three years indicates that for every dollar allowed for Institute operation, $40 of honey publicity was received. The Institute has rediscovered the consumer for the beekeeper. Through the Institute's influence, a code of ethics has gradually crept into the entire beekeeping industry.

In addition to its promotional activities, the Institute offers the following personal service to its members:

1. *Honor Roll Listing.*

   Every member is listed on the Honor Roll. This is printed annually. It is included in every set of Institute material sent to consumers, specialists and institutions; thus giving each member personal advertising.

2. *Contributor's Seal.*

   Every member may use the contributor's seal which sells for $1 and may be secured from the Institute office. It may be used on labels, letterheads and literature. By means of a mortise, the digits representing the year of membership can be changed and the seals used as long as the person is a member.

3. *Institute Honey Helpings.*

   Honey Helpings are recipe leaflets. They are available to members at cost. The literature is also furnished to non-members but their prices are higher. Distributing recipe leaflets to customers results in repeat orders for honey; giving them to others creates a new market. Sample copies with prices are available upon request.

4. *Miscellaneous Service.*

   A member may send in the names and addresses of his local home economics teachers, dietitians, doctors, cooking school directors, editors, homemakers and the Institute will mail a suitable set of material to the individual or organization.

   Special consultant service is available to members who wish help with marketing ideas, labels, recipe leaflets, demonstrations, etc.

   American Honey Institute does not furnish literature in quantity gratis.

   All members who cooperate with the Institute may capitalize on the following two programs:

   NATIONAL HONEY WEEK—November 10-16, 1935.
   (Suggested program is available upon request.)

   NATIONAL HONEY COOKERY CONTEST.
   (Rules and entry blank available upon request.)

List of Material Available.

To help you get the material you wish, a brief listing follows:

Consumers Service.

10 Cent Consumer Set.

The person wishing this set must send 10 cents in stamps or coin. It contains:

Using Honey*.
Honor Roll.
Salad Recipes.
Chemical Composition Chart.
New Uses For Our Oldest Sweet.
A Hundred Honey Helpings[1].

1½ Cent Consumer Set.

This set is sent free upon receipt of request. It contains:

30 Seasonal Honey Recipes.
Basic Rules for Using Honey.
Honor Roll.

Specialists Service.

Infant Bibliography—2 pages of references on the use of honey for babies.

Honey Bibliography—8 pages of references on honey.

Chemical Composition Chart, Honor Roll, Using Honey and current releases.

Institutional Service.

Quantitative Recipes are available to:

Bakers—

Honey in the Bakeshop (24 page booklet).
Honey Recipes by Camille Den Dooven.
Honey Helpings for Bakers (4 page mimeographed set).
Honey Can Be Used in Baked Goods (4 page, illustrated).

Hospitals—

Honey Dishes For The Convalescent.

Hotels and Restaurants—

Special Suggestions for hotel and restaurant service.

Basic rules for using honey, chemical composition chart, Honor Roll.

Producers Service.

National Honey Week Program—

Lists exhibit suggestions for all types of stores, continuity for honey broadcasts, bee and honey talks, newspaper and magazine articles and miscellaneous ideas.

Recipe Leaflets—

Sold at cost to members; sold at a higher price to non-members.
Samples of leaflets with prices available upon request.

Annual Report for 1934—per copy 6 cents.

---

* Using Honey—Carries the Seal of Acceptance of Foods Committee of American Medical Association. It gives fundamental rules for replacing sugar with honey, defines liquid, solid and comb honey, outlines various flavors of honey, and gives the latest information on chemical composition of honey.

[1] A Hundred Honey Helpings—Illustrated booklet containing 100 popular honey recipes and winning recipes of the 1934 Honey Cookery Contest.

Is the Institute Growing.

	No. of Members.	Amt. of Membership.	Aver. per mo.
The first Honor Roll covering April 1, 1930 to March 31, 1931 listed	289	$5,660.28	$471.69
The second Honor Roll covering April 1, 1931 to March 31, 1932 listed	297	5,770.88	480.07
The third Honor Roll covering April 1, 1932 to March 31, 1933 listed	473	5,718.94	476.58
The fourth Honor Roll covering April 1, 1933 to March 31, 1934 listed	800	6,483.54	540.28
The fifth Honor Roll covering April 1, 1934 to December 31, 1934* listed	830	4,480.96	497.88

*Only a 9-month period whereas others are for 12-months.

American Honey Institute—Illinois Memberships Since January 1, 1934.

Holm, C.	Genoa	$28.00
Evans, Richard K.	Hoopeston	1.00
Meineke, Ellsworth A.	Arlington Heights	5.00
Augenstein, A. A.	Dakota	1.00
McCormick, E. J.	Chicago, 6810 S. Winchester	1.00
Young, W. C.	Chicago, 8514 S. Elizabeth	1.00
Olson, C. A.	LaGrange, Edgeworth and 47th St.	.50
Lynn, Geo.	Lockport	2.00
Rife, C. A.	Naperville, 810 Chicago Ave.	1.50
Rector, L. W.	Blue Island, 12944 S. California	.50
Bodenschatz, Adam	Lemont, 610 Porter	1.00
Gill, A. G.	Evanston, 2240 Ashbury	5.00
Blake, M. F.	Mt. Morris	1.00
Hassler, Wm. M.	Princeton	1.00
Taylor, Curtis	Mounds	1.00
Page, Roy	McHenry	1.00
Schultz, J. C.	Chicago, 2045 W. Madison	1.00
Strope, J. Floyd	Pekin, 301 Caroline	1.00
Johnson, Alfred P.	Rankin	1.00
Bigler, George	Clarendon Hills, 21 Ogden	1.00
Woody, E. C.	Chicago, 1314 W. 31st St.	1.00
Wicklein, F. A.	Percy	1.00
Burdzilanskas, Joe	Pana, 505 N. Walnut	1.00
Hassler, Pearl	Princeton, Route 6	1.00
Reid, George H.	Carlinville	1.00
Rogers, H. S.	Chicago, 8952 Blackstone Ave.	2.00
Dean, L. A.	Big Rock	2.00
Greenwood, Donald W.	Wheaton	1.00
Donnell, Carson	Donnellson	1.00
Laughlin, Harold W.	Butler	2.00
Krebs, Phillip	Marissa	1.00
Doerman, A. W. T.	Blue Mounds	1.00
Jonkman & Oosting	Evergreen Park	1.00
Weed, Geo. H.	Lanark	1.00
Whiting, Ivan	Roscoe	1.00
Anderson, C. J.	Morris	12.15
Fisher, Lawrence W.	Woodson	2.49
Ness, L. L.	Morris	11.00
Milum, V. G.	Champaign	5.00
Hollowell, J. J.	Farmer City	2.54
Stanton, Edwin M., Jr.	Aurora, 1030 Chas. St.	1.00
Holmes, A. L.	Jacksonville	3.35

Duckwell, W. G.	Jacksonville	3.34
Rocke, Lawrence	Roanoke	2.00
Rocke, Raymond	Morton	2.00
St. Clair Bee Association	719 W. Monroe St.	5.00
Anonymous	Chicago	20.00
Duax, C. L.	Chicago, 3414 Western Ave.	1.00
Retzinger, Leo	Northbrook	1.00
Kennett, O. W.	Ohlman	2.00
Graham, Grant	Hillsboro, 1110 Marshall Ave.	1.00
Zadel, Frank	Witt	1.00
Nord, A.	Libertyville	1.00
Osborn, Wesley W.	Hillsboro	1.00
Kirlin, Elva	Warsaw	5.00
Gober, R. M.	Oregon	.50
Smith's Apiary	Greenville	1.00
Saline-Gallatin Co. Bee Ass'n.	Ridgeway	5.00
Oltmans, Oltman	Baileyville	1.00
LaSalle-Bureau Co. Bee Ass'n.	LaSalle	2.00
Baab, John	Chicago	1.00
Strieder, Mr. and Mrs. C. G.	Brimfield	1.50
Retzinger, Leo	Northbrook	1.00
Foots, Harvey	Green Valley	1.00
Rocke, R. H.	Morton	5.00
Claussen, S. S.	Oregon	1.00
LaRosh, Robert	Pekin	1.00
Bartruff, Adolph	Pekin	1.00
Belloth, Fred F.	Mt. Pulaski	1.00
Gill, A. G.	Chicago	5.00
Lohnes, Walter Scott	Pekin	1.00
Tyler, S. A.	San Jose	1.00
Rankin, R. E.	Payson	1.00
Vargo, J. J.	Granite City	3.60
Skinner, John	Albion	1.00
Total		$191.97

Total members—75.

REPORT OF ADVERTISING COMMITTEE.

Funds for the Advertising Committee were received from following sources—Beekeeping Associations, Bee Supply Houses, and Beekeepers:

Associations at $5.00 were as follows:

Cook-DuPage	Rock Island	Montgomery
Woodford	Peoria	Henry
Lake-McHenry	JoDaviess	

Morgan-Scott	$3.00
Will	4.50
Total	$47.50

Bee Supply Houses:

A. G. Gill (A. I. Root Co.), Chicago	$ 5.00
Dadant Company, Hamilton	10.00
G. B. Lewis Co., Watertown, Wis.	5.00
Total	$20.00

Beekeepers:

Reginald Bean	$1.00	Peter Vree	.50
C. J. Anderson.....	2.50	Frank Hoffman	1.00
L. L. Ness.....	2.50	C. L. Duax.....	2.00
Ed. Hendrickson	1.00	Herman Weipert	.50
Gun Mosee	.50	Richard Kriz	.25
Bro. Frederick	1.00	Elmer Lubeck	.50
L. Peterson	2.00	V. G. Milum.....	1.00
Total			$16.25
Grand total			$83.75

EXPENDITURES.

Illinois Folders	$55.00
Incidentals (Ham, Plates, etc.).....	3.35
University of Illinois Printing.....	4.87
Illinois Posters	13.00
Service Charges	1.50
Checks (Tax)	.08
Two Color Luncheon Menus.....	3.00
Total	$80.80
Total Receipts	$83.75
Final balance turned over to new Treasurer.....	2.95

IRENE W. DUAX, *Chairman.*
EDWIN F. PETERSON, *Treasurer.*

Publicity Accomplished by the Advertising Committee During the Year of 1934.

Out of 25,000 leaflets printed, 9,600 went to county association; 1,400 were left over and are being used as samples to give out to county association members who are interested in the activities of the Advertising Committee. That leaves 14,000 given out at the fair, 6,000 Honey Beauty, 10,000 leaflets from the University of Illinois.

The 6,000 Honey Beauty Hints and the 10,000 leaflets were in addition to the 25,000 printed leaflets, making 41,000 pieces in all—some record for the first year of an association!

WINNING RECEIPTS IN HONEY CULINARY AT THE 1934 STATE FAIR.

(Mrs. Bertha E. King, Superintendent.)

Plain Honey Bread.

First Prize.

3¼ cups flour
¼ yeast cake
1 tsp. salt
1 small potato
1 cup liquid
¾ tbsp. shortening
2 tbsp. honey

Proceed as for any other bread. Work extra well.

Plain Honey Bread.

Second Prize.

2 small potatoes
1 cake compressed yeast
3 tbsp. honey
4 cups warm water
1 tbsp. salt
3 tbsp. shortening

Run potatoes through a sieve into warm potato water. Add yeast, honey, salt and shortening and about 13 cups flour, which has been warmed. When adding first half of flour, beat hard. Proceed as for other bread.

Plain Honey Bread.

Third Prize.

4 cups lukewarm water
1 cake compressed yeast, dissolved in warm water
3 tbsp. honey
13¼ cups flour
3 tbsp. shortening
1 tbsp. salt
(Yields 4 loaves)

Proceed as for any other bread. Work extra well.

Ginger Bread.

First Prize.

½ cup sugar
1 cup butter
1 cup sour milk
2 tsp. soda (level)
1 tsp. cinnamon
2 tsps. ginger
½ cup honey
1 cup molasses
3 cups flour
3 eggs
1 tsp. cloves
Pinch of salt

Cream sugar, honey, molasses and fat. Add well beaten eggs and sour milk, beat well, add sifted dry ingredients. Beat well. Bake in moderate oven.

Ginger Bread.

Second Prize.

1½ cups flour
¼ cup brown sugar
¾ cup honey
½ tsp. ginger
⅛ tsp. cloves
½ cup fat
½ cup sour milk
1 tsp. baking powder
½ tsp. soda
½ tsp. cinnamon
½ tsp. salt
1 egg

Cream sugar and honey, add well beaten egg and milk alternately with sifted dry ingredients. Bake in moderate oven.

Honey Muffins.

First Prize.

2⅓ cups flour
3 tbsp. honey
4½ tsp. baking powder
4 tbsp. fat
1 tsp. salt
1 cup sweet milk
1 egg

Mix well and bake in muffin tins. Serve with butter and honey.

Honey Muffins.

Second Prize.

½ cup honey
1 cup flour
¼ tsp. soda
¼ tsp. salt
1 tbsp. melted butter
1½ cups milk

Mix well and beat thoroughly. Bake in gem pans. Serve with honey.

Honey Muffins.

Third Prize.

1 cup white flour
1 cup whole wheat flour
4 tsp. baking powder
½ tsp. salt
3 tbsp. honey
1 egg
1 cup sweet milk
3 tbsp. melted butter

Beat all together thoroughly. Bake in quick oven 15 to 20 minutes in muffin pans.

Honey Hermits.

First Prize.

½ cup honey
½ cup sugar
½ cup butter
2 eggs
¾ cups dates (chopped)
¼ cup candied pineapple (chopped)
½ tsp. cinnamon
½ tsp. ginger
1½ tsp. soda
2 cups flour

Cream butter, sugar and honey. Beat eggs. Have dates and pineapple chopped. Mix and sift dry ingredients three times. Add eggs to creamed mixture, then dates and pineapple, then dry ingredients. Bake 20 to 25 minutes in moderate oven.

Honey Hermits.

Second Prize.

½ cup butter
¾ each honey and brown sugar
2 tsp. sour milk
2 eggs
3 cups flour
1 cup raisins
1 cup currants
½ cup nuts
½ tsp. nutmeg
1 tsp. cinnamon
Other dried or candied fruits may be added if desired

Cream butter, sugar and honey. Beat eggs. Sift all dry ingredients three times. Add milk, soda, raisins, currants, and nuts. Mix rest of ingredients in this and bake 20 to 25 minutes in moderate oven.

Honey Hermits.

Third Prize.

4 tbsp. fat
½ cup brown sugar
½ cup honey
1 egg
½ cup milk
1½ cups flour
2 tsp. baking powder
¼ tsp. salt
½ tsp. cloves
1 tsp. allspice
1 tsp. cinnamon
¼ tsp. ginger
¾ cup nuts and raisins

Cream butter, sugar, and honey. Beat egg. Mix and sift dry ingredients three times. Add milk to creamed ingredients, also the eggs, nuts and raisins. Then add slowly, stirring in, all dry ingredients.

Honey Crisp Wafers.

First Prize.

1¼ cups flour
1 tsp. baking powder
¼ cup butter
¼ cup honey
¼ cup sugar
1 egg, well beaten
⅛ tsp. soda

Mix and beat extra well. Roll thin and bake in quick oven.

Honey Crisp Wafers.

Second Prize.

½ cup butter
⅓ cup sugar
1 tbsp. lemon juice
1 cup honey
2½ cups flour
3½ tsp. baking powder
¼ tsp. salt
1 egg

This must be thoroughly mixed, cream, butter, and sugar. Add unbeaten egg, beat well. Add honey and lemon juice. Then flour mixed and sifted with baking powder and salt. Roll dough thin, cut. Bake in moderate (350°F.) oven until nicely browned.

Honey Crisp Wafers.

Third Prize.

1½ cups sugar
1 cup lard
2 eggs
1 cup honey
2 tsp. soda
3 tbsp. cold water
1 tsp. cloves
1 tsp. cinnamon
1 tsp. ginger
1 tsp. salt
Flour

Mix and beat well using enough flour to make dough handle well. Roll thin, cut and bake until brown—10 to 15 minutes in moderate oven.

Honey Ginger Snaps.

First Prize.

¼ cup honey
¼ cup sugar
¼ cup butter
¼ tsp. soda
¼ tsp. ginger
1¼ cups flour

Mix well. Roll thin, cut and bake in moderate oven 15 to 20 minutes.

Honey Ginger Snaps.

Second Prize.

½ cup molasses
½ cup dark honey
½ cup butter
1 tsp. soda
1 tbsp. ginger

Mix molasses, honey and butter. Add ginger, and set over fire and stir until butter is melted. Then stir in 4 cups flour in which the soda has been sifted. Knead the dough until it becomes smooth. Set on ice over night. Then roll as thin as possible. Bake in hot oven. (These look like store snaps.)

Honey Ginger Snaps.

Third Prize.

Boil 1 cup lard, 1 cup sugar and 1 cup honey together. When almost cool add 2 well beaten eggs. Have flour sifted in pan. Add 1 tsp. ginger, 1 tsp. cinnamon, and pinch of salt. Pour boiled mixture into this and add 1 heaping tsp. soda, dissolved in 1 tbsp. vinegar. Make a soft dough, roll thin, bake in moderate oven.

Oatmeal Cookies.

First Prize.

½ cup butter creamed with ¼ cup sugar and ⅓ cup honey. Add 1 egg well beaten, then 1 cup flour in which ⅓ tsp. soda and ½ tsp. cinnamon have been sifted. Lastly add 1 cup oats and 1 cup raisins. Drop by spoonsful on buttered pan. Bake in quick oven 10 to 15 minutes.

Oatmeal Cookies.

Second Prize.

½ cup sugar
½ cup dark honey
1 cup butter
2 cups oatmeal
1 scant tsp. soda in 4 tbsp. sour milk
2 eggs (well beaten)
2 cups flour (sifted)
Pinch of salt
1 tsp. vanilla
1 cup ground raisins
1 tsp. cinnamon

Mix well and make in greased pans dropped by spoonful.

Honey Oatmeal Cookies.

Third Prize.

½ cup sugar
½ cup honey
1¼ cups flour
1¾ cups rolled oats
1¼ cups raisins
1 tsp. soda
1 tsp. cinnamon
½ tsp. cloves
Pinch of salt

Mix well and drop on greased pan by spoonful. Bake in hot oven 10 to 15 minutes.

Honey Divinity.

First Prize.

2 cups sugar
⅓ cup water
⅓ cup (light) honey
2 egg whites
Pinch of salt

Boil together sugar, honey, and water until syrup spins a thread when dropped from spoon (about 250°F.). Pour syrup over well beaten whites of eggs, beating all the time until mixture crystalizes. Drop in small pieces on wax paper or buttered marble. Place ½ nut meat on each piece if you like.

Honey Divinity.

Second Prize.

3 cups sugar
½ cup honey
1 cup water
2 egg whites
1 cup nut meats

Place sugar, water and honey in pan and cook together to 250°F. Pour over the well beaten egg whites. Beat until it stiffens. Add nut meats. Drop by spoonfuls on butter paper or pour in well buttered pan and cut into squares.

Honey Divinity.

Third Prize.

⅓ cup honey
2 cups sugar
⅓ cup water
2 egg whites
Pinch of salt

Boil sugar, honey and water together until syrup spins a thread when dropped from a spoon. Pour syrup over well beaten egg whites, beating continuously and until the mixture crystalizes. Drop in small pieces on wax paper.

Honey Devil's Food Cake.

Sweepstakes over all cakes at State Fair, 1934.

(This is an institute recipe.)

First Prize.

¾ cup honey
½ cup sugar
¾ cup milk
2½ cups cake flour
½ tsp. soda
½ cup fat
1 egg
2 squares bitter chocolate
½ teaspoon salt
2 tsps. baking powder

Cream sugar, fat, and honey thoroughly, add egg-yolk well beaten, then melted chocolate, add sifted dry ingredients alternately with liquid. Fold in egg white beaten until stiff. Bake in moderate oven (350 degrees F.) for forty-five to fifty minutes.

Honey Devil's Food Cake.

Second Prize.

2½ cups cake flour
¾ cup honey
⅔ cup butter
¾ cup sugar
4 squares chocolate
2 eggs
1 tsp. baking powder
1 tsp. soda
1 cup sour milk

Cream butter, honey, and sugar, add melted chocolate and egg yolks, add dry ingredients alternately with liquid. Lastly fold in stiffly beaten egg whites. Bake in moderate oven.

Honey Devil's Food Cake.

Third Prize.

½ cup butter
¾ cup strained honey
½ tsp. salt
½ cup cocoa
1¾ cup flour
½ tsp. soda
½ cup walnut meats (chopped)
¾ cup Kellogg's Kaffee Hag coffee (cold)
½ tsp. cinnamon
½ cup sugar
3 eggs separated
1 tsp. vanilla

Cream butter, add honey, sugar, and egg yolks, beat until mixture is light. Stir in nut meats and vanilla. Sift dry ingredients together and beat egg whites. To the creamed mixture add the dry ingredients alternately with coffee, stirring batter till smooth. Fold in egg whites and pour into buttered pans. Bake at 375°F. for twenty minutes, then down to 350°F. for fifteen minutes (2 layers).

Yellow Honey Cake.

First Prize.

1 cup honey (scant)
½ cup butter
2 eggs, well beaten
1 cup sour milk
2 cups flour
½ tsp. baking powder
1 tsp. soda

Cream butter, add milk and flour. Then honey. Its better than honey added to butter. Pint of flour if desired for right consistancy.

Yellow Honey Cake.

Second Prize.

1¼ cups sugar
¾ cup honey
½ cup shortening
1 cup milk
3 whole eggs
3 cups flour
4 tsp. baking powder

Cream shortening, sugar and honey. Add milk and eggs well beaten. Then flour in which baking powder has been sifted. Beat, beat, beat. Pour in well greased pans and bake in moderate oven.

Yellow Honey Cake.

Third Prize.

¾ cup butter
1¼ cup sugar
1 cup, less 1½ tbsp. of water
¾ cup honey
3 cups Swansdown cake flour
2 tsp. baking powder
⅛ tsp. soda
3 egg yolks and 1 egg white
1 tsp. vanilla

Cream butter, sugar and honey well. Sift flour, and measure, add baking powder and soda; sift together. Add water and flour alternately. Add flavoring. Fold in stiffly beaten eggs and beat vigorously. Bake in a moderate oven.

Honey Nougat.

First Prize.

2 cups sugar
½ cup honey
1 cup syrup
5 tbsp. nougat cream
½ cup water

Cook sugar, syrup, and honey together to 270°F. Remove from fire and stir in nougat cream. Add fruit and nuts. Mould in buttered pans. Cut and wrap.

Honey Nougat.

Second Prize.

⅜ cup honey
1 lb. almonds
½ cup brown sugar
2 egg whites (well beaten)

Cook honey and brown sugar until it spins a thread when tried. Pour over well beaten egg whites and beat well. Add almonds and pour into well greased pan. Cut and wrap.

Honey Nougat.

Third Prize.

3 lbs. sugar
1 lb. honey
3 lbs. glucose
1 pt. water

Cook to 248°F. whites of 4 eggs beaten stiff, then add tsp. vanilla. Add one-half above batch to eggs, beating constantly. Cook remainder to 256°F. Pour one-half batch into kettle. Beat until quite stiff. Add 1½ lbs. nutmeats. Pour into well buttered pan. Cut and wrap.

Honey Fudge.

First Prize.

2 cups sugar
2 tbsp. honey
1 cup milk or cream
Pinch salt

Cook until soft ball is formed when dropped in cold water. Then beat well and pour in mold and cut in squares.

Honey Fudge.

Second Prize.

¼ cup honey
2 cups sugar
1 cup evaporated milk
¼ tsp. salt
1 square chocolate (cut fine)
1 cup nutmeats

Boil sugar, chocolate, salt and milk for five minutes. Add honey and cook to soft ball stage (235°F.). Add butter, let stand until lukewarm. Beat until creamy. Add nuts. Pour on butter pan, when cold cut into squares.

Honey Fudge.

Third Prize.

2 cups sugar
5 tbsp. grated chocolate
1 cup honey
1 cup coffee cream
Pinch of salt

Cook until soft ball forms when dropped in cold water. Pour in well buttered pan. When cold cut into squares.

WINNING RECIPES OF THE PLEASANT PLAINS FARMERS INSTITUTE.

HONEY FUDGE—First—Mrs. Wm. Goff—New Berlin.
Second—Mrs. Hoyt Taylor—Pleasant Plains.
Third—Mrs. Carrie Rimmerman—Pleasant Plains.

HONEY OATMEAL COOKIES.
First—Ruth Widdows—Springfield.
Second—Mrs. Irwin Whitcomb—Pleasant Plains.
Third—Mrs. Wm. Goff—New Berlin.

HONEY MUFFINS.
First—Mrs. Wm. Goff—New Berlin.
Second—Mrs. John Shutt—Chatham.

HONEY DEVILS FOOD CAKE.
First—Mrs. Hoyt Taylor—Pleasant Plains.
Second—Mrs. Irwin Whitcomb—Pleasant Plains.
Third—Mrs. John Shutt—Chatham.

WINNING RECIPES OF THE STATE FAIR—(WITH HONEY).

First Prize—Honey Whole Wheat Bread (Four Loaves).

4 cups warm water
1 cake compressed yeast dissolved in warm water
3 tablespoons honey, 3 tablespoons fat, 1 tablespoon salt
4½ cups flour, 9 cups whole wheat flour
Proceed as for any bread.

Second Prize—Honey Whole Wheat Bread (One Loaf).

1 cup potato yeast
1 tablespoon salt
2 cups graham or whole wheat flour
1¾ cup white flour
2 tablespoons honey
1 tablespoon lard.
Proceed as for any potato yeast bread.

Third Prize—Honey Whole Wheat Bread.

2 small potatoes
1 cake compressed yeast
2 tablespoons honey
4 cups warm water
1 tablespoon salt
3 tablespoons honey
3 tablespoons fat

Run potatoes through sieve into warm potato water, add yeast, honey, salt and fat, and about 9 cups whole wheat flour, beat hard, then add 4 cups white flour. Proceed for other bread.

First Prize—Honey Oatmeal Gems.

3 cups flour
3 cups oatmeal
1 cup seedless raisins
1 cup honey
½ cup sugar
1 tablespoon vanilla
½ cup shortening
1¼ cup sweet milk
½ tablespoon soda
2 level tablespoons soda
2 level tablespoons baking powder
1 cup nut meats

Cream butter, honey and sugar thoroughly, then add milk, mix well, sift flour once before measuring, then add flour sifted at least three times, with baking powder, soda and salt, add next oats and nuts mixed. Chopped raisins add lastly the vanilla. Pour in well greased muffin tins and bake in hot oven, for 20 minutes.

Second Prize—Honey Oatmeal Gems.

½ cup honey
½ cup brown sugar
1 egg
1 cup cold water
1 cup oatmeal
1½ cup flour
2 tablespoons baking powder
1 tablespoon lemon extract

Add ½ cup of raisins last—No Method given.

Third Prize—Honey Oatmeal Gems.

½ cup sugar
½ cup honey
1 cup fat
1 tablespoon cinnamon
1 cup sour milk
1 tablespoon soda, 2 eggs, 2 cups oatmeal
2 cups flour, 1 cup raisins and nuts
½ tablespoon each of nutmeg and ginger

Cream sugar, fat and honey, add milk, then dry ingredients, add raisins and nuts, add eggs, mix well. Bake in Gem pans in moderate oven. 25 minutes. Level measures.

First Prize—Honey Date Bars.

⅔ cup flour
¾ cup nuts
½ tablespoon baking powder
2 eggs
½ pound dates
¼ tablespoon salt
¼ cup honey
¼ cup sugar

No method given.

Second and third prizes were Kellogs Honey Date Bars.

LIST OF AWARDS AT THE ILLINOIS STATE FAIR—1933.

CLASS J.

C. L. Duax, Superintendent; Judge, A. A. Leibold.

LOT 111—BEES AND HONEY.

Case of white comb honey, 24 sections—6 entries, 6 shown:

1st—Edwin Kommer, R. 4, Cambridge, Illinois	$7.00
2nd—Hoyt Taylor, Pleasant Plains, Illinois	5.00
3rd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois	3.00
4th—L. Peterson & Son, Kewanee, Illinois	2.00
5th—Walter I. Wright, R. 3, Tiskilwa, Illinois	1.00

Case of amber comb honey, 24 sections—6 entries, 4 shown:

1st—Edwin Kommer, R. 4, Cambridge, Illinois	$7.00
2nd—Peterson & Son, L., Kewanee, Illinois	5.00
3rd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois	3.00
4th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois	2.00

Frame of comb honey for extracting—5 entries, 5 shown:

1st—Adam Bodenschatz, 610 Porter St., Lemont, Illinois	$6.00
2nd—Edwin Kommer, R. R. 4, Cambridge, Illinois	4.00
3rd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois	2.00
4th—L. Peterson & Son, Kewanee, Illinois	1.00

Collection of labeled cases each containing 12 or more sections of white and amber—5 entries, 4 shown:

1st—Edwin Kommer, R. 4, Cambridge, Illinois	$10.00
2nd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois	7.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois	4.00
4th—L. Peterson & Son, Kewanee, Illinois	2.00

Display of comb honey, not less than 250 sections—5 entries, 5 shown:

1st—L. Peterson & Son, Kewanee, Illinois	$50.00
2nd—Edwin Kommer, R. 4, Cambridge, Illinois	35.00
3rd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois	25.00
4th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois	20.00
5th—Hoyt Taylor, Pleasant Plains, Illinois	15.00

Display of light extracted honey, 40 to 60 pounds—5 entries, 5 shown:

1st—Adam Bodenschatz, 610 Porter St., Lemont, Illinois	$10.00
2nd—Edwin Kommer, R. 4, Cambridge, Illinois	5.00
3rd—L. Peterson & Son, Kewanee, Illinois	3.00
4th—Hoyt Taylor, Pleasant Plains, Illinois	2.00
5th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois	1.00

Display of amber extracted honey, 40 to 60 pounds—5 entries, 5 shown:

1st—Edwin Kommer, R. 4, Cambridge, Illinois	$10.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois	5.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois	3.00
4th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois	2.00
5th—L. Peterson & Son, Kewanee, Illinois	1.00

Display of extracted honey, not less than 250 pounds—5 entries, 5 shown:

1st—Hoyt Taylor, Pleasant Plains, Illinois.....$40.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 30.00
3rd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 25.00
4th—L. Peterson & Son, Kewanee, Illinois..... 20.00
5th—Edwin Kommer, R. 4, Cambridge, Illinois..... 15.00

Display of candied honey, not less than 150 pounds—5 entries, 5 shown:

1st—Edwin Kommer, R. 4, Cambridge, Illinois.....$35.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 25.00
3rd—L. Peterson & Son, Kewanee, Illinois..... 20.00
4th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 15.00
5th—Hoyt Taylor, Pleasant Plains, Illinois..... 10.00

Display of designs in comb honey executed by the bees under the control of the apiarist—5 entries, 5 shown:

1st—L. Peterson & Son, Kewanee, Illinois.....$20.00
2nd—Edwin Kommer, R. 4, Cambridge, Illinois..... 15.00
3rd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 10.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 5.00

One frame observation hive, three banded Italian bees with queen—5 entries, 5 shown:

1st—Edwin Kommer, R. 4, Cambridge, Illinois..... $8.00
2nd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 6.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois..... 4.00
4th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 2.00

One frame observation hive, Golden Italian bees with queen—6 entries, 6 shown:

1st—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... $8.00
2nd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 6.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois..... 4.00
4th—Walter I. Wright, R. 3, Tiskilwa, Illinois..... 2.00

One frame observation hive, any other race except hybrids, three-banded and Golden Italian bees with queen, correctly named—5 entries, 4 shown:

1st—Hoyt Taylor, Pleasant Plains, Illinois..... $8.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 6.00
3rd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 4.00
4th—Edwin Kommer, R. 4, Cambridge, Illinois..... 2.00

Display of beeswax, not less than 25 pounds of wax moulded by the apiarist—5 entries, 5 shown:

1st—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois.....$25.00
2nd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 15.00
3rd—Edwin Kommer, R. 4, Cambridge, Illinois..... 12.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 9.00
5th—L. Peterson & Son, Kewanee, Illinois..... 6.00

Art designs in beeswax, not less than 5 pounds—5 entries, 5 shown:

1st—L. Peterson & Son, Kewanee, Illinois.....$15.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 10.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois..... 8.00
4th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 6.00
5th Edwin Kommer, R. 4, Cambridge, Illinois..... 4.00

Honey vinegar, one half gallon, with recipe for making—5 entries, 4 shown:

1st—L. Peterson & Son, Kewanee, Illinois..... $4.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 3.00
3rd—Edwin Kommer, R. 4, Cambridge, Illinois..... 2.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 1.00

Sweepstakes—5 entries, 5 shown.
1st—Edwin Kommer, R. 4, Cambridge, Illinois.....Ribbon
2nd—J. R. Wooldridge, 2021 W 70th St., Chicago, Illinois.....Ribbon
3rd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois.....Ribbon

LOT 112—BEES AND HONEY—(AMATEURS).

Case of white comb honey, 24 sections—2 entries, 2 shown:
1st—Albert Davis, Roseview Ave., Kewanee, Illinois..... $5.00
2nd—Wm. M. Hassler, Princeton, Illinois..... 3.00

Case of amber comb honey, 24 sections—2 entries, 2 shown:
1st—Wm. M. Hassler, Princeton, Illinois..... $5.00
2nd—Albert Davis, Roseview Ave., Kewanee, Illinois..... 3.00

Light extracted honey, 24 1-pound labelled jars—2 entries, 2 shown:
1st—Albert Davis, Roseview Ave., Kewanee, Illinois..... $5.00
2nd—Wm. M. Hassler, Princeton, Illinois..... 3.00

Amber extracted honey, 24 1-pound labelled jars—2 entries, 2 shown:
1st—Albert Davis, Roseview Ave., Kewanee, Illinois..... $5.00
2nd—Wm. M. Hassler, Princeton, Illinois..... 3.00

One frame Observation hive, three banded Italian bees with queen—2 entries, 2 shown:
1st—Wm. M. Hassler, Princeton, Illinois..... $5.00
2nd—Albert Davis, Roseview Avenue, Kewanee, Illinois..... 3.00

One frame Observation hive, Golden Italian bees with queen—2 entries, none shown.

Display molded beeswax, not less than 10 pounds—2 entries, 2 shown:
1st—Wm. M. Hassler, Princeton, Illinois..... $7.00
2nd—Albert Davis, Roseview Ave., Kewanee, Illinois..... 5.00

Best arrangement of the above entries and additional materials for an attractive display—2 entries, 2 shown:
1st—Wm. M. Hassler, Princeton, Illinois..... $12.00
2nd—Albert Davis, Roseview Avenue, Kewanee, Illinois..... 8.00

Amateur Sweepstakes—2 entries, 2 shown.
1st—Wm. M. Hassler, Princeton, Illinois.....Ribbon
2nd—Albert Davis, Roseview Avenue, Kewanee, Illinois.....Ribbon

LIST OF AWARDS AT THE ILLINOIS STATE FAIR—1934.

CLASS J.

Superintendent, C. L. Duax; Judge, Harry A. Luer.

LOT 109—BEES AND HONEY.

Case of white comb honey, 24 sections—9 entries, 9 shown:

1st—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... $7.00
2nd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 5.00
3rd—Edwin Kommer, Andover, Illinois..... 3.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 2.00
5th—O. R. Matthew, Virginia, Illinois..... 1.00

Case of amber comb honey, 24 sections—7 entries, 4 shown:

1st—Edwin Kommer, Andover, Illinois..... $7.00
2nd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 5.00
3rd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 3.00
4th—J. R. Wooldridge, 2021 N. 70th St., Chicago, Illinois..... 2.00

Frames of comb honey for extracting—9 entries, 8 shown:

1st—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... $6.00
2nd—Edwin Kommer, Andover, Illinois..... 4.00
3rd—D. J. Blocher, Pearl City, Illinois..... 2.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 1.00

Collection of labeled cases, each containing 12 or more sections of white and amber honey—6 entries, 5 shown:

1st—Edwin Kommer, Andover, Illinois.....$10.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 7.00
3rd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 4.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 2.00
5th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 1.00

Display of comb honey, not less than 250 sections—8 entries, 8 shown:

1st—Edwin Kommer, Andover, Illinois.....$50.00
2nd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 35.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois..... 25.00
4th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 20.00
5th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 15.00

Display of light extracted honey, 40 to 60 pounds—6 entries, 6 shown:

1st—Edwin Kommer, Andover, Illinois.....$10.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 5.00
3rd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 3.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 2.00
5th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 1.00

Display of amber extracted honey, 40 to 60 pounds—5 entries, 5 shown:

1st—Edwin Kommer, Andover, Illinois.....$10.00
2nd—Hoyt Taylor, Pleasant Plains, Illinois..... 5.00
3rd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 3.00
4th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 2.00
5th—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 1.00

Display of extracted honey, not less than 250 pounds—8 entries, 8 shown:

1st—Hoyt Taylor, Pleasant Plains, Illinois.....$40.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 30.00
3rd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 25.00
4th—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 20.00
5th—Tazewell County Beekeepers' Assn., Pekin, Illinois..... 15.00

Display of candied honey, not less than 150 pounds—5 entries, 5 shown:

1st—Edwin Kommer, Andover, Illinois.....$35.00
2nd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 25.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois..... 20.00
4th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 15.00
5th—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 10.00

Display of design in comb honey executed by the bees under the control of the apiarist—5 entries, 5 shown:

1st—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois.....$20.00
2nd—Hoyt Taylor, Pleasant Plains, Illinois..... 15.00
3rd—Edwin Kommer, Andover, Illinois..... 10.00
4th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 5.00

One frame observation hive, three-banded Italian bees with queen—6 entries, 6 shown:

1st—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... $8.00
2nd—Hoyt Taylor, Pleasant Plains, Illinois..... 6.00
3rd—Edwin Kommer, Andover, Illinois..... 4.00
4th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 2.00

One frame observation hive, Golden Italian bees with queen—8 entries, 7 shown:

1st—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... $8.00
2nd—O. R. Matthew, Virginia, Illinois..... 6.00
3rd—Hoyt Taylor, Pleasant Plains, Illinois..... 4.00
4th—Adam Bodenschatz, 610 Porter Street, Lemont, Illinois..... 2.00

One frame observation hive, any other race except hybrids, three-banded and Golden Italian bees, with queen, correctly named—5 entries, 5 shown:

1st—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... $8.00
2nd—Edwin Kommer, Andover, Illinois..... 6.00
3rd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 4.00
4th—Hoyt Taylor, Pleasant Plains, Illinois..... 2.00

Display of beeswax, not less than 25 pounds of wax moulded by the apiarist—6 entries, 6 shown:

1st—Edwin Kommer, Andover, Illinois.....$25.00
2nd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 15.00
3rd—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 12.00
4th—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 9.00
5th—D. H. Blocher, Pearl City, Illinois..... 6.00

Art designs in beeswax not less than 5 pounds—5 entries, 5 shown:

1st—Hoyt Taylor, Pleasant Plains, Illinois.....$15.00
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 10.00
3rd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois..... 8.00
4th—Adam Bodenschatz, 610 Porter St., Lemont, Illinois..... 6.00
5th—Edwin Kommer, Andover, Illinois..... 4.00

Honey vinegar, one-half gallon, with recipe for making—6 entries, 6 shown:

1st—Edwin Kommer, Andover, Illinois..... $4.00
2nd—Hoyt Taylor, Pleasant Plains, Illinois..... 3.00
3rd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois..... 2.00
4th—Tazewell County Beekeepers' Association, Pekin, Illinois..... 1.00

Sweepstakes:
1st—Edwin Kommer, Andover, Illinois.....Ribbon
2nd—J. R. Wooldridge, 2021 W. 70th St., Chicago, Illinois.....Ribbon
3rd—L. Peterson & Son, 1325 Pine St., Kewanee, Illinois.....Ribbon

LOT 110—BEES AND HONEY—(AMATEURS).

Case of white comb honey, 24 sections—6 entries, 5 shown:
1st—Wm. M. Hassler, Princeton, Illinois, R. F. D. No. 6..... $5.00
2nd—Albert Davis, 1206 Roseview Ave., Kewanee, Illinois..... 3.00
3rd—Lawrence Cook, 1218 Pine St., Kewanee, Illinois..... 2.00

Case of amber comb honey, 24 sections—5 entries, 4 shown:
1st—Albert Davis, 1206 Roseview Ave., Kewanee, Illinois..... $5.00
2nd—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois..... 3.00
3rd—C. C. Howser, Atlanta, Illinois..... 2.00

Light extracted honey, 24 1-pound labeled jars—4 entries, 3 shown:
1st—Lawrence Cook, 1218 Pine St., Kewanee, Illinois..... $5.00
2nd—Albert Davis, 1206 Roseview Avenue, Kewanee, Illinois..... 3.00
3rd—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois..... 2.00

Amber extracted honey, 24 1-pound labeled jars—4 entries, 4 shown:
1st—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois..... $5.00
2nd—S. A. Tyler, San Jose, Illinois..... 3.00
3rd—Lawrence Cook, 1218 Pine Street, Kewanee, Illinois..... 2.00

One frame observation hive, three banded Italian bees with queen—4 entries, 4 shown:
1st—Albert Davis, 1206 Roseview Ave., Kewanee, Illinois..... $5.00
2nd—Lawrence Cook, 1218 Pine St., Kewanee, Illinois..... 3.00
3rd—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois..... 2.00

One frame observation hive, three banded Italian bees with queen—3 entries, 1 shown:
1st—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois..... $5.00

Display molded beeswax, not less than 10 pounds—5 entries, 4 shown:
1st—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois..... $7.00
2nd—Lawrence Cook, 1218 Pine Street, Kewanee, Illinois..... 5.00
3rd—Albert Davis, 1206 Roseview Avenue, Kewanee, Illinois..... 3.00

Best arrangement of the above entries and additional materials for an attractive display—3 entries, 3 shown:
1st—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois.....$12.00
2nd—Lawrence Cook, 1218 Pine Street, Kewanee, Illinois..... 8.00
3rd—Albert Davis, 1206 Roseview Avenue, Kewanee, Illinois..... 5.00

Amateur Sweepstakes:
1st—Wm. M. Hassler, R. F. D. No. 6, Princeton, Illinois.....Ribbon
2nd—Albert Davis, 1206 Roseview Avenue, Kewanee, Illinois.....Ribbon
3rd—Lawrence Cook, 1218 Pine Street, Kewanee, Illinois.....Ribbon

NATIONAL HONEY COOKERY CONTEST.

RULES.

1. Contest is open to everyone.
2. All entries must reach Detroit, Michigan, by October 1, 1935.
3. Address entries to:
   American Honey Institute
   Detroit, Michigan. Attention: Cookery Contest.
4. An individual entry blank must accompany each entry. These may be obtained by writing American Honey Institute, Madison, Wisconsin. Be sure to state the number of blanks desired.
5. Entries in all classes may be made by an individual.
6. In mailing the package, be sure that:
   a. It is legibly and properly addressed.
   b. It contains your return address.
   c. It carries entry blank to assure proper identification. This may be done by pasting the envelope containing the blank on the outside of the package. The envelope requires a 3c stamp.

CLASSES.

Class A.

FRUIT CAKE.

Entries in this class must use *all honey* as a source of sweetening.

There will be two sections in this class:

1. Baked.
2. Unbaked.

Suggestions:

1. To prevent drying, wrap in waxed paper or cellophane.
2. Pack in corrugated paper for shipping.
3. Weight should average 1½ pounds.
4. Do not ice. Fruit decorations are desirable.

Class B.

CHOCOLATE COOKY.

Entries in this class must use at least *fifty per cent honey* as a source of sweetening.

Suggestions:

1. Pack in glass jar or tin can to prevent breaking.
2. At least one dozen cookies should be entered.
3. Cookies should *not* be iced.

Class C.

CARAMEL CANDY.

Entries in this class must use *thirty-three and one-third per cent* or more honey as a source of sweetening.

Suggestions:

1. Wrap pieces individually in wax paper or cellophane.
2. Enter at least one-half pound of candy.

JUDGING.

Judging will be based on the following points:

Appearance 10	Appearance 10	Appearance 10
Texture 20	Texture 15	Texture 15
Flavor 30	Flavor 40	Flavor 40
Eating Qualities.....20	Eating Qualities.....35	Eating qualities 35
Baking 10	Baking 10	
Age 10	Age 10	

PRIZES.

List of prizes available upon request.

CONSTITUTION AND BY-LAWS OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION.

CONSTITUTION.

ADOPTED FEBRUARY 26, 1891.

ARTICLE I.

This organization shall be known as The Illinois State Beekeepers' Association, and its principal place of business shall be at Springfield, Illinois.

ARTICLE II—OBJECT.

Its object shall be to promote the general interests of the pursuit of beeculture.

ARTICLE III—MEMBERSHIP.

SECTION 1. Any person interested in apiculture may become a member upon the payment to the Secretary of an annual fee of one dollar and fifty cents ($1.50). (Amended to $1.75, 1919; amended to $1.00 at annual meeting December, 1928.) And any affiliating association, as a body may become members on payment of an aggregate fee of fifty cents (50c) per member, as amended, November, 1910. (Associations must have affiliated 10 or more members in one of two previous years.)

SEC. 2. Any person may become honorary members by receiving a majority vote at any regular meeting.

ARTICLE IV—OFFICERS.

SECTION 1. The officers of this association shall be, President, Vice-President, Secretary and Treasurer. (Since amended to include 5 regional Vice-Presidents.) Their terms of office shall be for one year, or until their successors are elected and qualified.

SEC. 2. The President, Secretary and Treasurer shall constitute the Executive Committee.

SEC. 3. Vacancies in office—by death, resignation and otherwise—shall be filed by the Executive Committee until the next annual meeting.

ARTICLE V—AMENDMENTS.

This Constitution shall be amended at any annual meeting by a two-thirds vote of all the members present—thirty days' notice having been given to each member of the association.

BY-LAWS.

ARTICLE I.

The officers of the association shall be elected by ballot and by a majority vote.

ARTICLE II.

It shall be the duty of the President to call and preserve order at all meetings of this association; to call for all reports of officers and committees; to put to vote all motions regularly seconded; to count the vote at all elections, and declare the results; to decide upon all questions of order, and to deliver an address at each annual meeting.

ARTICLE III.

The Vice President shall be numbered, respectively, First, Second, Third, Fourth, and Fifth, and it shall be the duty of one of them, in his respective order, to preside in the absence of the President.

ARTICLE IV.

SECTION 1. It shall be the duty of the Secretary to report all proceedings of the association, and to record the same, when approved, in the Secretary's book; to conduct all correspondence of the association, and to file and preserve all papers belonging to the same; to receive the annual dues and pay them over to the Treasurer, taking his receipt for the same; to take and record the name and address of every member of the association; to cause the Constitution and By-Laws to be printed in appropriate form and in such quantities as may be directed by the Executive Committee from time to time, and see that each member is provided with a copy thereof; to make out and publish annually, as far as practicable, statistical tables showing the number of colonies owned in the spring and fall, and the amount of honey and wax produced by each member, together with such other information as may be deemed important, or be directed by the Executive Committee; and to give notice of all meetings of the association in the leading papers of the State, and in the bee journals at least four weeks prior to the time of such meeting.

SEC. 2. The Secretary shall be allowed a resonable compensation for his services, and to appoint an assistant Secretary if deemed necessary.

ARTICLE V.

It shall be the duty of the Treasurer to take charge of all funds of the association, and to pay them out upon the order of the Executive Committee, taking a receipt for the same; and to render a report of all receipts and expenditures at each annual meeting.

ARTICLE VI.

It shall be the duty of the Executive Committee to select subjects for discussion and appoint members to deliver addresses or read essays, and to transact all interim business.

ARTICLE VII.

The meeting of the association shall be, as far as practicable, governed by the following order of business:

Call to order.
Reading minutes of last meeting.
President's address.
Secretary's report.
Treasurer's report.
Reports of committees.
Unfinished business.
Reception of members and collection.
Miscellaneous business.
Election and installation of officers.
Discussion.
Adjournment.

ARTICLE VIII.

The By-Laws may be amended by a two-thirds vote of all the members present at any annual meeting.

C. E. YOCUM,
AARON COPPIN,
GEO. F. ROBBINS.

CHARTER MEMBERS.

Col. Charles F. Mills, Springfield.
Hon. J. M. Hambaugh, Spring.
Hon. J. S. Lyman, Farmingdale.
C. P. Dadant, Hamilton.
Chas. Dadant, Hamilton.
A. N. Draper, Upper Alton.
S. N. Black, Clayton.
Aaron Coppin, Wenona.
Geo. F. Robbins, Mechanicsburg.
J. W. Yocum, Williamsville.
Thos. S. Wallace, Clayton.
A. J. England, Fancy Prairie.
P. J. England, Fancy Prairie.
C. E. Yocum, Sherman.
Jas. A. Stone, Bradfordton.

HONORARY MEMBERS.

1891—Thos. G. Newman, Editor American Bee Journal, Chicago.
1892—Frank Benton, Agricultural Dept., Washington, D. C.
Rev. W. F. Clarke, Guelph, Ontario.
1893—Rev. A. H. Bates, Springfield.
Col. Chas. F. Mills, Springfield.
1894—Geo. W. York, Chicago.
(Now Editor Bees and Honey, Alhambra, California.)
A. I. Root, Medina, Ohio.
W. Z. Hutchinson, Flint, Michigan.
E. R. Root, Medina, Ohio.
C. P. Dadant, Hamilton, Illinois.
Dr. C. C. Miller, Marengo, Illinois.
E. D. Townsend, Altamont, Michigan.
1911—Dr. E. F. Phillips, Cornell University, Ithaca, N. Y.
Dr. G. Bohrer.
Miss Lillian M. Stewart.
1919—Jas. A. Stone, Farmingdale, Illinois.
Aaron Coppin, Wenona, Illinois.
1928—Dr. A. C. Baxter, Springfield.
A. L. Kildow, Putnam.
1934—Adam Bodenschatz, Lemont, Illinois.
Charter members deceased 1931-1934—
Jas. A. Stone, Springfield, Illinois.
A. N. Draper, Upper Alton.
Charter member living 1935—
C. P. Dadant, Hamilton, Illinois.

UNITED STATES DEPARTMENT OF AGRICULTURE.

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE,

WASHINGTON, D. C.

INFORMATION ABOUT BEE CULTURE.

There are many persons in the United States who own bees, but there are not enough who keep bees efficiently or who make beekeeping a speciality. Efficiency in beekeeping is based upon a thorough knowledge of the life and behavior of bees, upon foresight and lack of procrastination, the proper use of equipment, and careful attention to marketing problems.

This circular is prepared to present in brief form certain information not included in the following bulletins. If your beekeeping questions are not answered in the department publications, the Bureau of Entomology and Plant Quarantine will be glad to render any further assistance possible.

JAS. I. HAMBLETON,
Senior Apiculturist.

PUBLICATIONS FOR SALE.

The following publications may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., by postal money order, express order, or New York draft. If currency is sent, it will be at sender's risk. Postage stamps, defaced or worn coins, foreign coins and uncertified checks will not be accepted:

Farmers' Bulletin 653—Honey and Its Uses in the Home..... 5 cents
Farmers' Bulletin 695—Outdoor Wintering of Bees..... 5 cents
Farmers' Bulletin 961—Transferring Bees to Modern Hives..... 5 cents
Farmers' Bulletin 975—Control of European Foulbrood..... 5 cents
Farmers' Bulletin 1012—Preparation of Bees for Outdoor Wintering. 5 cents
Farmers' Bulletin 1014—Wintering Bees in Cellars..... 5 cents
Farmers' Bulletin 1039—Commercial Comb Honey Production..... 5 cents
Farmers' Bulletin 1198—Swarm Control ..... 5 cents
Farmers' Bulletin 1215—Beekeeping in the Clover Region..... 5 cents
Farmers' Bulletin 1216—Beekeeping in the Buckwheat Region..... 5 cents
Farmers' Bulletin 1222—Beekeeping in the Tulip-tree Region..... 5 cents
Farmers' Bulletin 1713—Treatment of American Foulbrood..... 5 cents
Department Circ. 284—Sterilization of American Foulbrood Combs.. 5 cents
Department Circ. 287—Occurrence of Diseases of Adult Bees, II.... 5 cents
Circular 24—United States Grades, Color Standards and Packing Requirements for Honey. A chart showing requirements for grades of honey is included ..... 5 cents
Technical Bulletin 149—Fungous Diseases of the Honeybee.....10 cents
Technical Bulletin 309—The Development of Package-Bee Colonies..10 cents

Dept. Bulletin 810—European Foulbrood .....10 cents
Dept. Bulletin 1339—Effect of Weather Upon the Change in Weight of a Colony of Bees During the Honeyflow.....10 cents
Dept. Bulletin 1349—Brood-rearing Cycle of the Honeybee.....10 cents
Dept. Bulletin 1364—Effects on Honeybees of Spraying Fruit Trees with Arsenicals ..... 5 cents

HONEY POSTER AND COMB HONEY GRADING CHART.

It's All Good Honey—an educational poster 21" x 30" printed in four colors, designed to acquaint the public with honey.....15 cents
Comb Honey Grading Chart—showing U. S. standard color requirements for comb honey..... 5 cents

PAPERS APPEARING IN THE JOURNAL OF AGRICULTURAL RESEARCH.

Reactions of the Honeybee to Light, by L. M. Bertholf, Vol. 42, No. 7, April, 1931 .....20 cents
Some of the Characteristics of Yeasts Found in Fermenting Honey, by G. E. Marvin and others. Vol. 43, No. 2, July, 1931.....20 cents
The Distribution of Stimulative Efficiency in the Ultra-Violet Spectrum for the Honeybee, by L. M. Bertholf, Vol. 43, No. 8, October, 1931 .....20 cents
Relation of Commercial Honey to the Spread of American Foulbrood, by A. P. Sturtevant. Vol. 45, No. 5, September, 1932 (Reprint K-228) ..... 5 cents
The Flight Range of the Honeybee, by J. E. Eckert, Vol. 47, No. 5, September, 1933 (Reprint K-242) ..... 5 cents
Some Physiological Effects of Ultraviolet Radiation on Honeybees, by L. M. Bertholf, Vol. 47, No. 6, September, 1933 (Reprint K-243). 5 cents
Changes in Total Nitrogen Content During the Life of the Imago of the Worker Honeybee, by M. H. Haydak, Vol. 49, No. 1, July, 1934 (Reprint K-250) ..... 5 cents

COOPERATIVE PUBLICATIONS.

Honey Marketing in California. Bulletin 554.

Economic Aspects of the Bee Industry. Bulletin 555.

Both by E. C. Voorhies, F. E. Todd, and J. K. Galbraith. Available from the University of California, College of Agriculture, Agricultural Experiment Station, Berkeley, California.

Cost of Producing Honey in Oregon. Progress Report No. 1, Circular No. 83.

Cost of Producing Honey in Oregon. Progress Report No. 2, Circular No. 100.

Both by A. S. Burrier, F. E. Todd, and H. A. Scullen. Available from the Agricultural Experiment Station, Oregon State Agricultural College, Corvallis, Oregon.

MULTIGRAPHED AND MIMEOGRAPHED CIRCULARS.

(Obtainable from the Bee Culture Laboratory, Bureau of Entomology and Plant Quarantine, Department of Agriculture, Washington, D. C.)

Preliminary Report on Apiary Organization and Honey Production in the Intermountain States in 1928.

Recommendations for Shipping Cages for Bees (E-287).

List of Dealers in Beekeeping Supplies, Package Bees, and Queens (E-297).

U. S. Grades for Honey.

The design of a stamp authorized for use with all United States grades of honey is shown at the left. The use of the U. S. Grade stamp on retail packages of honey will give customers a greater confidence in the quality and purity of the product. Circular 24, United States Grades, etc., (see page 1) describes the United States grades on all classes of honey.

Quotations giving the record of actual sales of honey on the leading markets of the country are given in the MARKET NEWS SERVICE issued semi-monthly by the Bureau of Agricultural Economics, United States Department of Agriculture, and will be sent free upon request.

Field Stations.

Federal experimental field laboratories where apicultural research is conducted are maintained at the following places:

Intermountain Bee Culture Field Laboratory, Laramie, Wyoming; Southern States Bee Culture Field Laboratory, Baton Rouge, La.; Pacific Coast Bee Culture Field Laboratory, Davis, California.

Film and Lantern Slides.

Two moving picture films on bees are lent without charge by the Office of Motion Pictures, Extension Service, United States Department of Agriculture, Washington, D. C., the borrower having to pay only the transportation to and from Washington. Copies of these films may be purchased (either in 35 or 16 millimeter width) at approximately the cost of printing.

The Realm of the Honeybee—A new four-reel film showing interesting phases of the life and habits of the honeybee. The film is replete with closeups of bees gathering nectar and pollen, performing the "food dance", feeding one another, and driving out drones and robber bees. It shows how bees sting. A fatal encounter between two rival queens is also recorded, as well as an interesting picture of a swarm issuing from a hive and clustering on a nearby branch. The film closes with scenes of how honey is removed from the hive and prepared for sale, and shows a few of the ways in which honey can be used.

How Bees Live and Work—A one-reel film showing a queen laying eggs, the development of worker bees from the egg to the adult, and some of the duties performed by the worker bees. The bottling and labeling of extracted honey by machinery is briefly shown, as well as some of the phases in the production of comb honey.

The following series are available as lantern slides and film strips from the Extension Service, Office of Cooperative Extension Work, United States Department of Agriculture, Washington, D. C., both for loan and by purchase.

The Anatomy of the Honey Bee—Series 151 (lantern slide only).
Transferring Bees to Modern Hives—Series 167.
Handling Bees for Successful Beekeeping—Series 172.
Diagnosis of Bee Diseases in the Apiary—Series 171.
First Lessons in Beekeeping—Series 346.

Books on Beekeeping.

Books for sale by bee supply houses and book dealers. Prices are approximate and subject to change. For list of supply houses see last page.

ABC and XYZ of Bee Culture	Root	$2.00
American Honey Plants	Pellett	3.00
Anatomy and Physiology of the Honeybee	Snodgrass	3.50
Beekeeping	Phillips	4.00
Beekeeping in the South	Hawkins	1.00
Dadant System of Beekeeping	Dadant	1.00
Honey Bees and Fairy Dust (for children)	Mary Phillips	2.00
Honey Plants of North America	Lovell	2.00
How to Succeed With Bees	Atkins & Hawkins	.59
The Honeybee (23rd edition revised by Dadant)	Langstroth	2.50
Law of the Honey Bee	Campbell	1.00
Life of the Bee	Maeterlinck	2.25
The Mystery of the Hive	Evrard	2.50
Practical Queen Rearing	Pellett	1.00
Productive Beekeeping	Pellett	3.00
Queen Rearing Simplified	Smith	1.25
Romance of the Hive	Pellett	2.00
Scientific Queen Rearing	Doolittle	.50
Spirit of the Hive	Sharpe	2.50
Starting Right With Bees	Rowe	.50

Bee Journals.

American Bee Journal, Hamilton, Illinois, monthly.....$1.00 per year
Beekeepers' Item, Box 838, San Antonio, Texas, Monthly..... 1.00 per year
Bees and Honey, 236 West Valley Blvd., Alhambra, California, monthly ..... 1.00 per year
Gleanings in Bee Culture, Medina, Ohio, monthly.....$1.00 per 2 years
The Bee World (official organ of the Apis Club), Brockhill, London Road, Camberley, Surrey, England, monthly..... 1.84 per year

Beekeepers' organizations.

American Honey Institute—An organization sponsored and supported by the Bee Industries Association, beekeepers organizations and individuals. Its purpose is to give wide publicity to the uses of honey through demonstrations, lectures, radio talks, and the dissemination of recipies and other literature. Malitta F. Jensen, Secretary, Room 310, Commercial State Bank Building, Madison, Wisconsin.

American Honey Producers' League—An educational organization of beekeepers representing State and national marketing and educational beekeepers' organizations, as well as individual beekeepers, in the United States and Canada. Annual membership dues of $1.00 include subscription to the Annual Report of the League. Remittance should be made to V. G. Milum, Secretary-Treasurer, Vivarium Building, Champaign, Ill.

Apis Club—Membership in the Apis Club is open to any person or society interested in the honeybee. Annual dues (this includes The Bee World) for an individual member are 10/6d ($1.84). Members of associations, clubs, and other bodies affiliated with the Apis Club can obtain the Bee World and membership through their organization for 7/6d ($1.31). Membership in the Apis Club will be accepted at the office of the Secretary, Brockhill, London Rd., Camberley, Surrey, England.

Southern Conference—An organization of southern honey producers, package bee producers, and queen breeders devoted to the interest of beekeeping in the southern states. G. G. Puett, Secretary, Hahira, Georgia.

State Beekeepers' Organizations—A Beekeepers' Association exists in practically every state. Information about the State Association can usually be obtained through your State Department of Agriculture.

Cardinal Points to be Observed in Keeping Bees.

(1) Bees need in the spring—plenty of stores, plenty of room for brood rearing, and plenty of protection.
(2) Swarming is undesirable at all times and should be strictly controlled. See Farmers' Bulletin 1198 for methods of control.
(3) During a honey flow, bees should be given plenty of storage room. Failure to do this will cause the loss of the crop.
(4) Bees need protection from cold and wind wherever the winter temperatures fall as low as freezing. See Farmers' Bulletin 1012 and 1014.
(5) It is unprofitable and in many states illegal to keep bees in box hives or "gums."
(6) It does not pay to cultivate any plant for bees alone. Nectar resources may be improved by planting such plants as sweet clover on waste lands.
(7) If the bees are short of stores, feed a sirup of equal parts of clean granulated sugar and water.

Diseases of Bees.

In many parts of the country beekeepers are suffering losses from American and European foulbrood, the two most serious brood diseases. European foulbrood can be controlled by proper corrective measures, but American foulbrood, the more serious of the two, requires a more drastic treatment. The bees and combs of American foulbrood infected colonies should be burned. A system of apiary inspection is maintained in most states, to which should be referred questions concerning the identity of the disease and proper methods of control. Samples of brood and adult bees which are difficult to diagnose may be sent to the Bureau of Entomology, Bee Culture Laboratory, for determination.

Bee Supply Houses.

Dadant & Sons, Hamilton, Illinois; Diamond Match Co., Chico and Los Angeles, California; W. T. Falconer Manufacturing Co., Falconer,

New York; G. B. Lewis Co., Watertown, Wisconsin; Fred W. Muth Co., Pearl & Walnut Streets, Cincinnati, Ohio; A. I. Root Co., Medina, Ohio; Superior Honey Co., Ogden, Utah; A. G. Woodman, Grand Rapids, Michigan.

Beekeeping Localities.

Information relative to beekeeping conditions in specific localities can usually be obtained from the State Department of Agriculture. Most of the State Universities, Colleges and Experiment Stations have also issued special bulletins on the subject of beekeeping.

CODE OF RULES AND STANDARDS FOR JUDGING BEE AND HONEY EXHIBITS AT FAIRS AS ADOPTED BY ILLINOIS STATE BEEKEEPERS' ASSOCIATION.

General rule for quantity on all items listed in Premium List unless otherwise stated: Full score will be given for amounts on open display called for under premium numbers in Fair Catalogue. Greater quantities will receive no preference.

Variation of these rules to apply to amateur divisions will be permitted at the discretion of the judge.

COMB HONEY.

Comb honey will be judged on a scale of 100 points as follows:

A—Quantity—20. B—Quality—40. C—Style of Display—40.

B—Quality—40—Distribution of points will be as follows:

(a) Variety—5: Five different kinds only with regard to floral source are necessary to score full points. In judging single cases of comb honey no notice is given variety, and five points on variety shall be given to that case which conforms most closely to color called for in premium list. This rule will apply both to single cases in amateur and professional divisions.

(b) Whiteness of cappings—10: Capping color to be consistent to variety, with freedom from travel stain and water soaked appearance. Clover and Basswood honey should be white; Heartsease, a dull white, tinged with yellow; Spanish Needle, a bright yellow.

(c) Completeness of attachment—10: Freedom from uncapped cells and bee-way holes with comb drawn and filled clear to the wood of section.

(d) Straightness of combs and similarity of section—5: Freedom from drone comb, wavy comb and sagging cell structure. No comb shall project beyond wood of section.

(e) Cleanliness of section—10: Freedom from finger prints, propolis, dirt, shavings, wax or any foreign substance.

C—Style of Display—40—Distribution of points shall be as follows:

1. For display of comb honey not in cases.

(a) Attractiveness in the manner of display—15: Design in which the comb honey is set up, relative to the power to attract attention.

(b) Neatness of wrapping—10: Freedom from wrinkles, looseness, unglued flaps, crooked wrappers, finger prints and superfluous glue.

(c) Visibility of sections through wrappers front and back—10: Clarity of cellophance, with all-cellophane being given preference over combination cellophance-glasine wrappers and window cartons.

(d) Uniformity of design of wrappers—5: Similarity of wrappers used in display and color scheme.

2. For display of comb honey in cases.

(a) Cleanliness of case, wood and glass—10: Freedom from finger marks, grease, dirt, fly specks, leaking honey, water marked wood or rusty nails.

(b) Visibility of sections—10: Double tier will be given preference over single; glass front over plain.

(c) Manner of packing, cleanliness, safeness of shipping—10: Sufficient clean corrugated packing to hold sections firmly in shipment.

(d) Arrangement of cases in display—10: Placement to the best advantage for the general harmony of the exhibit.

EXTRACTED HONEY.

Extracted honey will be judged on a scale of 100 as follows:
A—Quantity—25; B—Quality—45; C—Style of Display—30.
B—Quality—45. Distribution of points will be as follows:

(a) Variety and color—5: Five varieties with regard to floral source only are necessary to score full points. Color must be in accordance with variety. Cloudiness will detract strongly from this score. In judging forty to sixty pound groups of extracted honey no notice is given variety. The five points on variety will be given to that forty to sixty pound exhibit which conforms most closely to color called for in premium list. This rule will apply also to the extracted honey in the amateur divisions.

(b) Freedom from contamination—6: Absence of wax particles, pollen, propolis, parts of bees, lint, paper particles or any other undesirable visible substance. Particles adhering to inside of lid shall be considered as being contained in the honey.

(c) Body—6: Honey of sufficient thickness to pick up well on a knife blade, yet not so thick as to be objectionably gummy, conforming as closely as possible to the government standard of eleven and three-quarters pounds (11¾) per gallon.

(d) Flavor—8: Corresponding to floral source. Freedom from any deleterious qualities such as pollen, fermentation, carmelization due to overheating or improper flavor due to exposed metallic surfaces.

(e) Style of package—7: Packages which show natural beauty of the honey to best advantage without darkening shadows. Glass packages will be given preference over tin, flint glass over green, and smaller vessels over larger, provided the large vessels contain over (3) pounds.

(f) Variety of package—5: Different sizes consistent with a good retailing property. Six poular sizes in glass and/or tin, on open display, only necessary to score full points. In addition, cans or kegs for wholesaling may be considered.

(g) Finish—8: Capping, labeling and bottle polish. Lug, screw or anchor caps shall rate equally. Caps sealing top edge of jar shall be given preference. Beauty of honey must not be obscured by excessive label. Color of label should harmonize. Label must be printed with net weight in legal size type. The wording "extracted honey" or "pure honey" shall be considered equal. Uniformity of labeling, freedom from excessive paste and high polish of glass will be rated.

C—Style of Display—30: Attractiveness of arrangement and general impression with regard to neatness and general harmony. Artistic arrangement will receive preference.

CRYSTALLIZED OR GRANULATED HONEY.

Granulated honey will be judged on a scale of 100 points as follows:
A—Quantity—25; B—Quality—45; Style of Display—30.
B—Quality—45. Distribution of points will be as follows:

(a) Variety and color—5: Five varieties with regard to floral source only are necessary to score full points. Color must be in accordance with variety to receive full score.

(b) Freedom of contamination—6: (See B—(b) under Extracted Honey). Also freedom from bubbles due to fermenting honey or of watery nature due to separation of crystals.

(c) Fineness of grain—9: Smoothness of texture, freedom from large hard crystals, eveness of color and freedom of streaks or odd crystal formation.

(d) Flavor—6: (See B—(d) under Extracted Honey.)

(e) Style of package—7: Package which will show natural beauty of the honey to best advantage with regard to sales stimulation which is held above other considerations in the retail trade. Glass packages will be given preference over tin, flint glass over green and smaller vessels over larger, provided the larger vessels contain over 3 pounds.

(f) Variety of package—5: See B—(f) under Extracted Honey.
(g) Finish—7: See B—(g) under Extracted Honey.
C—Style of Display—35: See C under Extracted Honey.

BEESWAX.

Beeswax will be judged on a scale of 100 points as follows:
A—Quantity—30; B—Quality—40; C—Style of Display—30.
B—Quantity—40. Distribution of points will be as follows:
(a) Aroma—10: A sweet pleasant bouquet such as exists in virgin wax, without being tainted from any source such as scorching, propolis, soap or other foreign odors.
(b) Color—15: A clear bright yellow, although some slight attention may be given to novel color. A preponderance of color other than light yellow shall detract.
(c) Freedom from Contamination—15: Absence of dirt, propolis, honey or any other deleterious material other than pure beeswax.
C—Style of Display—30. Distribution of points will be as follows:
1.—For Moulded Wax.
(a) Novelty of Mould—15: Chiefly the attractiveness of the design.
(b) Workmanship—15: Excellence of the finished product, with freedom from shrink cracks, bubbles on surface. Consideration will be given difficult molds over those of less difficulty.
2.—For Art Designs in Beeswax.
(a) Workmanship—15: That piece or pieces most carefully, neatly and skillfully done shall score highest.
(b) Artistic Appeal—15: Attractive appearance with attention drawing qualities and showing the most beautiful and interesting design.

ART DESIGNS IN COMB HONEY.

Art designs in comb honey will be judged on a scale of 100 points as follows:
A—Quantity—20; B—Quality—40; C—Style of Display—40.
A—Quantity—20: Will be judged by relation of one exhibitor's amount to that of the others, the greatest quantity scoring highest.
B—Quality—40: Distribution of points will be as follows:
(a) Variety—10.
(b) Whiteness of cappings—10.
(c) Completeness of cappings—10.
(d) Completeness of filling—10.
C—Style of Display—40: Distribution of points will be as follows:
(a) Novelty of Design—15: Originality, beauty and attractiveness being the prime considerations.
(b) Neatness of Workmanship—15: General cleanliness and excellence of construction of pieces.
(c) Manner of Exhibition—10: Beauty given to pieces by the manner of exhibition.

NUCLEI OF BEES.

Bees in Observation Hives will be marked on a scale of 100 points as follows:
(a) Style of Hive—10: Bees must be shown only in the form of single frame nuclei or hives with glass sides. That hive which is neatest and best made and shows the bees and contents to the best of advantage will score the highest on this point.
(b) Color markings and size of bees—40: Color must be uniform for the individuals of the nucleus, corresponding to those claimed for the races in their purity, as given in ABC and XYZ in Bee Culture. Large sized bees will be preferred.

(c) Brood—15: The largest quantity of brood in all stages or nearest to that will score highest.

(d) Queen—10: Queen must be present in order that a nucleus may qualify for judging. Queens must be true to color for the race. Larger queens will be given preference. Crippled or sluggish queens will detract from score on queen.

(e) Quietness—10: Freedom from running or other nervous action, consistent with the general conditions under which exhibited.

(f) Comb Perfection—15: Freedom from drone comb, sagging cell structure, holes, bridge comb marks or bridge combs. Combs capable of rearing brood over the greatest surface will be preferred, with sufficient honey stored to carry the bees well during fair week.

FRAME OF COMB HONEY FOR EXTRACTING.

Frame of Honey for extracting shall be judged on a score of 100 as follows:

A—Quantity—20; B—Quality—45; C—Style of Display—35.

A—Quantity—20: Points of quantity must be only frames of regulation Langstroth full depth size shall score full points on quantity more frames than called for in Fair catalogue shall receive no preference. Smaller frames must score less.

B—Quality—45: Points of quality will be judged as follows:

(a) Whiteness of capping—10: Freedom from travel stain or water soaked appearance, capping color to be consistent to variety, the lightest variety and capping to score highest.

(b) Completeness of capping and attachment—10: Freedom from uncapped cells, freedom from bee-ways and holes between comb and frame.

(c) Straightness of comb—10: Freedom from drone comb, sagging cell structure and wavy with indentations.

(d) Adaptability to uncapping—5: That comb which is thick enough to use the uncapping knife on to best and most rapid advantage.

(e) Cleanliness—10: Freedom from finger prints, propolis, dirt, or other foreign discoloration of wood or comb.

(a) Manner of protection from elements (dust, flies, etc.)—15: Protection which protects the frame most securely yet affords the best unobstructed view of the contents, (a clear cellophane wrapper securely fastened shall score highest).

(b) Attractiveness in decorating and arranging comb to best advantage —15: Additional work and material in preparing comb together with the way it is supported and placed in the exhibit that the public may see where extracted honey comes from.

(c) Neatness of wrapping and decorating—5: Smoothness of covering security of its fastening, attractiveness of decorating and harmony of colors used with regard to rest of exhibit.

MEMBERS OF ILLINOIS STATE BEEKEEPERS' ASSOCIATION FOR 1933-34.

V. B. Adams, Sheldon, Ill.
C. W. Aeppler & Co., Oconomowoc, Wis.
Elmer Aavang, Route 3, Woodstock, Ill.
E. W. Adcock, Assumption, Ill.
Edward Adam, Strawn, Ill.
James Allen, Kirtland, Ill.
F. O. Allen, Stockland, Ill.
Henry Ammon, Galena, Ill.
Frank Amos, 1328 E. Main, Decatur, Ill.
C. J. Anderson, Route 2, Box 102, Morris, Ill.
C. F. Anderson, Route 5, Mt. Vernon, Ill.
James Andrews, Cherry Valley, Ill.
Ralph Annear, Mulkeytown, Ill.
Roy Annear, Mulkeytown, Ill.
John Ammann, R. R. 2, Deland, Ill.
Chas. Aten, Jr., Arenyville, Ill.
Robert R. Atkinson, Port Byron, Ill.
Fred Attig, Ashton, Ill.
A. A. Augenstein, Route 2, Dakota, Ill.
D. C. Bacon, Crystal Lake, Ill.
R. Badie, 3710 W. 67th Pl., Chicago, Ill.
M. D. Bailey, R. R. 2, Hanover, Ill.
J. W. Bailey, Coal Valley, Ill.
T. Baker, Genoa, Ill.
E. H. Bangs, 168 Addison Road, Riverside, Ill.
Earl Baker, Genoa, Ill.
D. M. Barcus, Genoa, Ill.
R. J. Barthoff, Richmond, Ill.
Oscar Barton, 254 Lebanon, Belleville, Ill.
Fred Ball, 112 Willard St., Kewanee, Ill.
Roy Baxley, Christopher, Ill.
Dr. A. C. Baxter, Myers Office Bldg., Springfield, Ill.
B. E. Beach, 126 Clifford Ave., Rockford, Ill.
Reginald Bean, 1409 Forest Ave., Mt. Vernon, Ill.
Arthur Bechtold, 731 Virginia, Belleville, Ill.
Tom Beddoes, 318 Marion Ave., Rockford, Ill.
Henry Beechman, Mackinaw, Ill.
H. D. Bearman, Mt. Morris, Ill.
Robert Beer, Roanoke, Ill.
Alving Bell, Ridgway, Ill.
B. F. Bell, Box 56, Kingston Mines, Ill.
Mrs. Paradine Bell, Box 56, Kingston Mines, Ill.
W. C. Beese, 211 Ellis St., Peoria, Ill.
A. Berthold, 5733 N. Cicero Ave., Chicago, Ill.
William Biegel, Route 3, Barrington, Ill.
L. F. Binder, Harvard, Ill.
Wm. Bloner, Cary, Ill.
M. E. Blake, Mt. Morris, Ill.
G. J. Boehland, Corey's Bluff, Rockford, Ill.
A. C. Boettcher, R. R. 1, O'Fallon, Ill.
Adam J. Bodenschatz, Box 272, Lemont, Ill.
Ed. Boberg, Cambridge, Ill.
Jas. A. Bonebrake, R. R. 2, Georgetown, Ill.
Henry Bowman, Rockford, Ill.
Joe Burdzilduskas, Sr., N. 4 Johns St., Pana, Ill.
Joe Burdzilduskas, Jr., Pana, Ill.
Wayne Burrows, 725 Island Ave., Rockford, Ill.
Albert I. Brennemann, R. F. D. 2, Pekin, Ill.
Wm. B. Brigham, 1301 N. East St., Bloomington, Ill.
L. H. Brockman, Jerseyville, Ill.
Wm. Brosius, Galva, Ill.
W. K. Brown, R. R. 4, Box 94, Springfield, Ill.
E. B. Brown, Nashville, Ill.
John Brodeski, 1310 N. Center St., Joliet, Ill.
C. W. Brown, Route 2, Shelbyville, Ill.
E. W. Brown, Box 117, Willow Springs, Ill.
Brown, Lynch, Scott Co., Monmouth, Ill.
E. H. Bruner, 3836 N. Kostner Ave., Chicago, Ill.
Bruns Seed Store, Davenport, Iowa.
H. J. Bryan, Market St., Normal, Ill.

Fred Bulterman, Michigan City Rd., South Holland, Ill.
D. H. Bunker, La Fox, Ill.
Kenneth Burch, R. R. 3, Rockford, Ill.
A. L. Burnett, 1428 31st St., Rock Island, Ill.
Carl E. Byers, Cissna Park, Ill.
Geo. W. Byers, Cissna Park, Ill.
Geo. S. Cable, El Paso, Ill.
Chas. Campbell, 7019 S. Stewart Ave., Chicago, Ill.
Hez Carnahan, R. R. 4, Harrisburg, Ill.
F. B. Carey, 2807 Summerdale Ave., Rockford, Ill.
Ed. Carlson, 1921 6th St., Rockford, Ill.
P. A. Carlson, Galva, Ill.
W. J. Caughey, Orion, Ill.
Geo. S. Cable, El Paso, Ill.
Clarence Cecil, Atkinson, Ill.
Ray I. Clapp, R. R. 2, Hinsdale, Ill.
L. H. Clark, 1003 N. Second St., Rockford, Ill.
W. S. Clark, 1352 N. Broadway, Decatur, Ill.
J. Claude, Route 1, Sandwich, Ill.
R. Clausen, Lake Forest, Ill.
S. S. Claussen, 1005 S. 5th St., Oregon, Ill.
Aurthur Clough, Donnellson, Ill.
George Chapman, Green Valley, Ill.
Fred Cole, Hillsdale, Ill.
Roy Concidine, DeKalb, P. O. Elva, Ill.
Elmer Conklin, R. R. 2, Box 140, O'Fallon, Ill.
E. T. Cook, Mundelein, Ill.
Cook Bros., Pecatonica, Ill.
A. C. Cooper, Wyoming, Ill.
Mrs. Wm. Cooper, Butler, Ill.
T. A. Cotta, 211 Webster Ave., Rockford, Ill.
J. E. Cullison, Shelbyville, Ill.
W. Craske, 2148 W. 107th Pl., Chicago, Ill.
Theo. Cyarnecki, R. R. 2, Belleville, Ill.
C. P. Dadant, Hamilton, Ill.
E. J. Dahlquist, 4636 N. Kenneth Ave., Chicago, Ill.
Geo. Dail, Marissa, Ill.
Albert Davis, Roseview Ave., Kewanee, Ill.
J. B. Davis, 1210 E. Main St., Urbana, Ill.
Palmer Davis, Homer, Ill.
Peter De Crane, Atkinson, Ill.
Rev. Dean, Cordova, Ill.
L. A. Dean, R. R. 1, Big Rock, Ill.
A. Dengler, 916 N. Illinois, Belleville, Ill.
Herman Denhart, R. R. 3, St. Joseph, Ill.
Ed Dennis, Casner, Ill.
Frank Desort, Lincoln, Ill.
J. Devitt, Sparta, Ill.
Geo. Diel, Box 16, Marissa, Ill.
A. W. T. Doermann, 2554 W. Grove St., Blue Island, Ill.
Carson Donnell, Donnellson, Ill.
E. J. Dorais, 510 N. Ardmore Ave., Villa Park, Ill.
Oamer M. Doty, R. R. 6, Decatur, Ill.
Willis Drehmer, Osco, Ill.
Wm. Duax, 3414 S. Western Ave., Chicago, Ill.
C. L. Duax, 3414 S. Western Ave., Chicago, Ill.
W. G. Duckwall, R. R. 2, Jacksonville, Ill.
C. W. Duerrstein, Route 1, Galena, Ill.
Hugh A. Duffy, R. F. D. 1, Serena, Ill.
H. L. Dunn, Onarga, Ill.
Frank R. Durkee, Route 6, Ottawa, Ill.
Ethel H. Earl, Dalton City, Ill.
C. F. Earle, Dalton City, Ill.
W. Eckert, R. R. 2, Millstadt, Ill.
Frank Eckhardt, Dalton City, Ill.
Chas. Ecklund, 10316 Spaulding Ave., Chicago, Ill.
Lester Edwards, Piper City, Ill.
Miss Rolean Entwistle, 109 Fourth St., LaSalle, Ill.
E. Elliff, R. R. No. 4, Galena, Ill.
Geo. Eich, 711½ N. Broadway St., Joliet, Ill.
A. Erst, Algonquin, Ill.
Otto M. Essig, 1825 30th St., Moline, Ill.
H. N. Evans, 521 Homestead Ave., Peoria, Ill.
I. C. Evans, 1037 W. Marietta, Decatur, Ill.
Richard K. Evans, R. R. No. 1, Hoopeston, Ill.
Geo. Eykamp, Maryland, Ill.
J. A. Farmer, 326 Portland Ave., Belleville, Ill.
Ernest Fehr, Eureka, Ill.
Joe Fellner, R. R. No. 2, Belleville, Ill.
L. W. Fisher, Woodson, Ill.
Benj. H. Fischer, Roanoke, Ill.
A. R. Flink, Streator, Ill.
Chas. T. Flota, 207 Dayton Ave., Harrisburg, Ill.

F. A. Folk, Polo, Ill.
Frank Folmer, R. R. No. 1, E. Carondelet, Ill.
Harvey Foote, Green Valley, Ill.
W. H. Force, 1714 W. Church St., Champaign, Ill.
H. Franek, Box 246, Algonquin, Ill.
Brother Frederick, Techny, Ill.
W. E. Frierdich, 1105 Briston St., Belleville, Ill.
Herman Froelke, Palos Park, Ill.
Forbes Fuller, 5147 Warwick Ave., Chicago, Ill.
Ora Funkhouser, 724 Big 4th St., Eldorado, Ill.
H. G. Frymier, Carbon Cliff, Ill.
R. M. Gober, Oregon, Ill.
Nelson Gache, Clifton, Ill.
John A. Gage, 612 N. 12th St., Mt. Vernon, Ill.
Neil Gale, Pecatonica, Ill.
W. B. Gardner, Solon Mills, Ill.
A. G. Gill, 2240 Asbury Ave., Evanston, Ill.
J. M. Gard, 1007 W. Beardsley, Champaign, Ill.
John L. Gasnow, 1020 12th Ave., Moline, Ill.
W. Gauch, Box 26, Freeburg, Ill.
Geo. B. Gillett, Hanna City, Ill.
E. M. Glascock, R. R. 2, Eldorado, Ill.
Edward Gnitzinger, R. R. No. 2, Box 431, DesPlaines, Ill.
R. M. Gober, Route No. 1, Oregon, Ill.
John Godfrey, R. R. No. 5, Jacksonville, Ill.
Alfred Godke, 1121 June Street, Kewanee, Ill.
C. W. Goodwin, 2400 E. North St., Decatur, Ill.
J. S. Gordon, R. R. No. 1, Lincoln, Ill.
Grant Graham, 1110 Marshall St., Hillsboro, Ill.
Theo. Graham, 523 E. Tremont St., Hillsboro, Ill.
Chas. Grimm, St. Jacob, Ill.
Edwin Gutherz, Millstadt, Ill.
Melville M. Guthrie, 4845 N. Meade Ave., Chicago, Ill.
Edwin C. Hacker, R. R. No. 3, Danville, Ill.
Chas. Hage, Vandalia, Ill.
John Haizman, Fox River Grove, Ill.
Nicholas Hamer, Rartsburg, Ill.
G. L. Hankammer, 719 W. Monroe, Belleville, Ill.
Phil C. Hankammer, R. R. No. 5, Belleville, Ill.
Geo. P. Harding, Monticello, Ill.
Ellis Harper, R. R. 1, Eldorado, Ill.
W. W. Harris, Box 565, Malta, Ill.
Joseph M. Hart, 303 E. Church St., Harrisburg, Ill.
T. W. Harris, 401 N. 59th, E. St. Louis, Ill.
Ben Hartke, Buckley, Ill.
Wm. Hassler, R. R. No. 4, Princeton, Ill.
H. L. Haslip, 4022 Lincoln St., E. St. Louis, Ill.
Thos. J. Hayes, R. R. No. 2, Taylor Ridge, Ill.
L. T. Hayworth, South Pekin, Ill.
A. C. Heflin, Greenview, Ill.
Jerome Heger, City Hall, Decatur, Ill.
Val. Heil, Box 142, Marissa, Ill.
Ellis Henderson, 414 N. Fayette St., Jacksonville, Ill.
Edney Hendrickson, 1316 Lisbon St., Morris, Ill.
Geo. Hennes, 3343 S. Western Ave., Chicago, Ill.
A. W. Hickey, Egan, Ill.
Curtis Highsmith, 2615 Cherry St., Mt. Vernon, Ill.
Edward Hilquest, Donivan, Ill.
H. F. Hilquest, Donivan, Ill.
A. P. Hill, 15939 Carse Ave., Harvey, Ill.
C. E. Hill, Windsor, Ill.
Geo. H. Hill, 425 Crittenden, Hillsboro, Ill.
B. W. Hillner, 209 S. Highland Ave., Rockford, Ill.
Peter Hinsberger, R. R. No. 1, E. Moline, Ill.
Paul Hobart, Roscoe, Ill.
Jacob Hoerr, South Pekin, Ill.
F. C. Hofer, R. R. No. 2, Taylor Ridge, Ill.
Frank Hoffman, 39th and Stanley Ave., Riverside, Ill.
Chris. Holm, Box 381, Genoa, Ill.
A. L. Holmes, R. R. No. 5, Jacksonville, Ill.
Wm. Howard, Worth, Ill.
Albert Hrankay, Rand Rd., R. R. No. 1, Box 6, DesPlaines, Ill.
W. Hubert, Jr., 1801 E. C. St., Belleville, Ill.
R. W. Hudspeth, Hillsboro, Ill.
Hy J. Hummert, Mascoutah P. O., Ill.
Ray Husen, 223 Beltrberg Rd., Rockford, Ill.
Jackson Wesley, LeRoy, Ill.
W. H. Jackson, Toulon, Ill.
J. Jacobson, Spring Grove, Ill.
C. P. Jankowski, Gurnee, Ill.
Edward Jeffrey, Galena, Ill.
Malitta F. Jensen, 310 Commercial Natl. Bank Bldg., Madison, Wis.

Alfred P. Johnson, Rankin, Ill.
Alex Johnson, 512 Hibbard St., Joliet, Ill.
Carl A. Johnson, 417 S. Vine St., Kewanee, Ill.
Frank Johnson, Toulon, Ill.
John F. Johnson, R. R. No. 1, Box 99, E. Moline, Ill.
Mary F. Johnson, 418 S. Adams St., Peoria, Ill.
Norman Johnson, R. R. No. 3, Kewanee, Ill.
Pardon Johnson, R. R., Taylor Ridge, Ill.
H. W. Jones, Cary, Ill.
L. A. Junod, 421 S. 2nd St., Greenville, Ill.
John Kadel, Taylor Ridge, Ill.
C. F. Kannenberg, 1114 Augusta St., Oak Park, Ill.
Xanier Kiefer, Belle Rive, Ill.
Andy Keag, Geneseo, Ill.
J. H. Keiner, New Athens, Ill.
L. R. Keith, Earlville, Ill.
Philip Keller, R. R. No. 1, New Athens, Ill.
P. C. Keller, 2105 W. Cedar Rd., Homewood, Ill.
O. W. Kennett, Ohlman, Ill.
Mrs. O. W. Kennett, Ohlman, Ill.
Emery Kerher, 222 N. High, Belleville, Ill.
Jesse L. Kidd, R. R. No. 1, Champaign, Ill.
Conrad Kiefner, R. R. No. 2, Joliet, Ill.
A. L. Kildow, Putnam, Ill.
Chas. King, Moline, Ill., R. R. 1.
Harry L. King, R. R. No. 5, Springfield, Ill.
F. M. Kirby, 113 E. White, Champaign, Ill.
Wm. S. Kirk, Farmersville, Ill.
Ed. Klein, 317 Carbough Ave., Rockford, Ill.
Edward M. Klein, Gurnee, Ill.
Joseph Klein, Swanwick, Ill.
J. W. Klein, Freeburg, Ill.
Albert Knack, Geneseo, Ill.
Chas. Knantz, Galena, Ill.
H. B. Knapp, R. R. No. 4, Rockford, Ill.
H. C. Knoeppel, Bluffs, Ill.
Gus Koderhaudt, R. R. No. 2, Lebanon, Ill.
Ed. E. Koerner, 210 S. Center St., Geneseo, Ill.
Chas. Kohr, 9245 S. Western Ave., Chicago, Ill.
Edward Kohbold, 9th and Peoria St., Peru, Ill.
Ed. Kommer, R. R. No. 4, Andover, Ill.
Elmer Kommer, Woodhull, Ill.
J. N. Koritz, R. R. No. 3, Buckley, Ill.
Woodrow Koritz, Buckley, Ill.
Wm. Kormelink, 134 Fremont St., Ottawa, Ill.
Joseph Kosar, 22 N. 78th, Belleville, Ill.
F. Kottrash, R. R. No. 1, Deerfield, Ill.
Philip Krebs, R. R. No. 1, Marissa, Ill.
E. Kreher, 222 N. High, Belleville, Ill.
Henry Krieppel, Bluffs, Ill.
Richard Kriz, Palos Park, Ill.
Anna Krier, Dee Rd. and Touhy Ave., DesPlaines, Ill.
Geo. Kroeper, R. R. No. 2, Henry, Ill.
Adolph Krummow, R. R. No. 2, Box 29, Galva, Ill.
Kruse & Killian, Paris, Ill.
Bob Kuchne, Lake Forest, Ill.
Jacob Kunz, 714 Iowa St., Urbana, Ill.
H. LaSell, 609 S. Wright St., Champaign, Ill.
Dr. W. C. Ladwig, 249 Geneva Ave., Elmhurst, Ill.
John L. Laird, Opdyke, Ill.
Guy C. Lakin, R. R. No. 1, Joliet, Ill.
Victor Lamandin, R. R. No. 2, Eldorado, Ill.
James Lamb, 446 W. Locust St., Canton, Ill.
Ben Lamfeir, Forreston, Ill.
H. R. Lamont, Apple River, Ill.
Mrs. R. P. Landers, 10857 S. Whipple St., Chicago, Ill.
Robert Larosh, R. R. No. 1, Pekin, Ill.
Harold Laughlin, Butler, Ill.
M. E. Larby, 1761 N. 40th, E. St. Louis, Ill.
Mrs. M. Larson & Son, Gardner, Ill.
Walter Layton, Royal, Ill.
Robert Lee, R. R. No. 1, E. Moline, Ill.
A. Leinback, Waterloo, Ill.
E. G. LeStourgeon, The Beekeepers Item, San Antonio, Texas.
Elmer Leubeck, Route 1, Elwood, Ill.
Fred Lingner, R. R. No. 1, E. Moline, Ill.
J. Levey, 1806 S. 61st Ave., Cicero, Ill.
Walter Scott Lohnes, Pekin, Ill.

H. A. Luer, Jerseyville, Ill.
Wm. N. Luft, South Pekin, Ill.
Robert Lynn, 5th and Madison St., Lockport, Ill.
C. A. Mackelden, Jerseyville, Ill.
Harry Mackey, Box 27, Winnebago, Ill.
J. A. MacNeill, 11339 S. Irving Ave., Chicago, Ill.
M. C. Madison, Clifton, Ill.
L. Madsen, Gardner, Ill.
M. Halz, 21 Hunt Ave., Ingleside, Ill.
John Marsh, Midoaks, Box 54, Ritchie, Ill.
Wm. Marshall, 1015 Pleasant St., DeKalb, Ill.
Herbert J. Martin, R. R. No. 6, Decatur, Ill.
Gerald W. Mason, Zion, Ill.
O. R. Matthew, Virginia, Ill.
Lincoln McCaully, R. R. No. 2, Orland Park, Ill.
G. W. McClain, Port Byron, Ill.
J. H. McClure, Manchester, Ill.
Herman McConnell, Robinson, Ill.
E. J. McCormick, 6810 S. Winchester Ave., Chicago, Ill.
John McDonals, Jr., Richmond, Ill.
E. L. McDowell, Galena, Ill.
Mrs. Louise McEwen, Mansfield, Ill.
Geo. McGee, Winnebago, Ill.
Clark McGrady, Mackinaw, Ill.
F. A. McGrew, 201 E. Penn Ave., Hoopeston, Ill.
Ralph McInnes, Signey, Ill.
J. W. McKenrick, Silvis, Ill.
Roy McKenrick, Silvis, Ill.
D. F. McNeely, Rankin, Ill.
Edward Mader, 112 Gilbert St., Belleville, Ill.
August Meenen, R. R. No. 6, Rockford, Ill.
Fred Meinen, Baileyville, Ill.
Dr. R. C. J. Meyer, 1815 3rd Ave., Moline, Ill.
Richard Meyers, R. R. No. 1, South Holland, Ill.
Leone Michelangeli, 2311 E. South Grand, Springfield, Ill.
R. R. Mick, R. R. No. 2, Eldorado, Ill.
Jasper A. Middleton, Gardner, Ill.
Edward Mier, Bluffs, Ill.
F. H. Miller, Wilson, Ill.
H. E. Miller, Aledo, Ill.
V. G. Milum, Vivarium Bldg., Champaign, Ill.
Chas. A. Minkler, 645 E. Pearl St., Ottawa, Ill.
Chas. Newman, R. R. No. 3, Clearing Station, Ill.
B. L. Miracle, Brighton, Ill.
W. T. Moffet, Oakford, Ill.
Jocob N. Mohr, R. R. No. 1, Box 75, East Moline, Ill.
Chas. Mon, Polo, Ill.
L. J. Monti, 1432 Benton St., Rockford, Ill.
S. B. Moon, 505 Machin Ave., Peoria, Ill.
F. W. Morrison, 117 N. Seminary St., Georgetown, Ill.
Ross R. Morrill, R. R. No. 1, Geneva, Ill.
Gun Mozee, 1017 Dakin St., Chicago, Ill.
John Mueller, Bluffs, Ill.
C. H. Murrary, Mackinaw, Ill.
C. W. Mussulman, Hammond, Ill.
J. W. Myrtle, 443 Jilson Ave., Rockford, Ill.
Wm. Myers, Kankakee, Ill.
H. H. Nance, Windsor, Ill.
L. L. Ness, Morris, Ill.
A. C. Norris, 241 Rockton Ave., Rockford, Ill.
Henry J. Nowlan, 510 E. College St., Greenville, Ill.
Edward W. Nowack, 5613 Dunham Rd., Downers Grove, Ill.
Chas. R. Nussell, Villa Grove, Ill.
John O'Brien, Newark, Ill.
F. G. Oexner, R. R. No. 4, Waterloo, Ill.
Mr. C. A. Olson, Edgeworth and 47th St., LaGrange, Ill.
Harry Oosting, Evergreen Park, Ill.
J. Ortscheid, Seward, Ill.
David Osborn, Butler, Ill.
Howard Osborn, Butler, Ill.
Wesley W. Osborn, Hillsboro, Ill.
Raymond Ott, Geneseo, Ill.
F. G. Oxner, R. R. No. 4, Waterloo, Ill.
A. Paddock, Round Lake, Ill.
Ray Page, McHenry, Ill.
Emil J. Palmer, Oregon, Ill.
J. B. Payne, R. R. No. 2, Georgetown, Ill.
R. Parks, 310 N. Independence Ave., Rockford, Ill.
Vincent Peifer, R. R. No. 8, Lincoln, Ill.
Frank Peifer, R. R. No. 1, Lincoln, Ill.
F. W. Peters, 727 Lebanon Ave., Belleville, Ill.
Alfred Peterson, 658 Roscoe, Chicago, Ill.
Elmer Peterson, Sandwich, Ill.
Edwin Peterson, 1325 Pine St., Kewanee, Ill.
Lawrence Peterson, 1325 Pine St., Kewanee, Ill.
S. F. Peterson, 2326 Third Ave., East Moline, Ill.

Lee. Pfaff, Box 201, Rockton, Ill.
Dr. E. F. Phillips, Dept. of Entomology, Cornell University, Ithaca, New York.
Lewis Binnow, Crystal Lake, Ill.
M. J. Pitzen, McHenry, Ill.
Al. Pond, Cordova, Ill.
A. L. Pool, Latham, Ill.
Marion J. Porter, Pittsfield, Ill.
Austin Powers, Sterling, Ill.
Lanson Pratt, 1244 S. 4th, Pekin, Ill.
Everett Price, Toulon, Ill.
Henry Price, Elizabeth, Ill.
Marion Price, R. R. No. 1, Pekin, Ill.
Oliver Price, R. R. No. 1, Pekin, Ill.
John Passfield, McHenry, Ill.
Louis Rabideau, Clifton, Ill.
R. E. Rankin, Payson, Ill.
P. Rasmussen, Monroe Center, Ill.
O. G. Rawson, 3208 Forest Pl., East St. Louis, Ill.
Wm. Rebbe, Bluffs, Ill.
Joseph Reber, R. R. No. 5, Shelbyville, Ill.
L. W. Rector, 12944 S. California Ave., Blue Island, Ill.
E. J. Rees, R. R. No. 5, Urbana, Ill.
T. A. Reeve, Auburn, Calif.
Wm. Reid, Box 85, Andalusia, Ill.
L. F. Reisinger, 1024 S. Water St., Decatur, Ill.
Edgar W. Rench, N. Elm St., Greenville, Ill.
Otto J. Rezek, Box 100, Fox River Grove, Ill.
A. W. Reznicek, 600 S. 19th, Belleville, Ill.
Mr. Richardson, 9510 S. Peoria St., Chicago, Ill.
C. F. Rife, R. R. No. 1, Naperville, Ill.
John Rigan, 1349 W. Wood St., Decatur, Ill.
Geo. W. Rigler, Prophetstown, Ill.
Dow Ripley, Taylor Ridge, Ill.
E. G. Rippie, 1431 Jackson St., Beloit, Wis.
Henry Ritter, Pennsylvania Ave., Rockford, Ill.
Leo Ritzinger, Northbrook, Ill.
W. L. Ritter, R. R. No. 1, Hampshire, Ill.
A. Rybikowski, North Chicago, Ill.
F. A. Rumery, LaSalle, Ill.
D. Rosso, R. R. No. 2, Centerville Sta., Ill.
E. R. Root, Editor Gleanings in Bee Culture, Medina, Ohio.
Lewis F. Roller, Lincoln, Ill.
Virgil E. Rocke, Eureka, Ill.
Raymond H. Rocke, Box 34, Morton, Ill.
Lawrence Rocke, Roanoke, Ill.
Mrs. Lillian Robinson, Midlothian, Ill.
Leonard Robbins, Mt. Sterling, Ill.
Lawrence Robins, Mt. Sterling, Ill.
Geo. Robbins, Box 323, Edgemont Sta., E. St. Louis, Ill.
Geo. L. Sauer, Polo, Ill.
Pearly Sang, Roberts, Ill.
Clarence Salmons, R. R. No. 3, Brownstown, Ill.
F. Sack, R. R. No. 1, Deerfield, Ill.
John J. Schafer, R. R. No. 2, Port Byron, Ill.
Clarence Schave, E. Moline, Ill.
G. Schemmer, Dupo, Ill.
J. P. Scheid, Eureka, Ill.
E. Schlesinger, 1031 S. Chas., Belleville, Ill.
J. B. Schlosser, Wadsworth, Ill.
O. A. Schrieber, German Valley, Ill.
Mathias Schmidt, 105 Summit St., Joliet, Ill.
A. B. Schofield, Paxton, Ill.
Gilbert Schwark, Geneseo, Ill.
C. T. Scott, R. R. No. 5, Harrisburg, Ill.
W. D. Scott, Bowdich Ave., Aurora, Ill.
August Siegle, 9705 S. Kedzie Ave., Evergreen Park, Ill.
Chas. Seigel, 3000 W. 95th St., Evergreen Park, Ill.
G. F. Seitz, Taylor Ridge, Ill.
Henry C. Seitz, Reynolds, Ill.
Wilbert Seiving, Chapin, Ill.
Joseph Seyka, 252 Ill. Ave., Elgin, Ill.
E. Shad, Clifton, Ill.
W. L. Shafer, 314 York Rd., Hinsdale, Ill.
Shallenberger, 7058 Parnell Ave., Chicago, Ill.
August Siegle, 9705 S. Kedzie Ave., Evergreen Park, Ill.
Chas. A. Siegle, 3000 W. 95th St., Evergreen Park, Ill.
G. F. Seitz, Taylor Ridge, Ill.
Mrs. Eleanor N. Simmer, 9607 Beverly Ave., Chicago, Ill.
Albert Simmons, R. R. No. 1, Milan, Ill.
Ralph D. Simms, Rankin, Ill .
Ralph D. Simms, Rankin, Ill.
Ill.
F. J. Simons, 120 Willard Ave., Rockford, Ill.
W. E. Sincock, R. R. 1, Scales Mound, Ill.
J. M. Singer, 1619 East St., Ottawa, Ill.
I. W. Sisk, 3024 Regent, East St. Louis, Ill.
S. S. Slater, Genoa, Ill.

Bill Sleaford, Atkinson, Ill.
W. H. Small, Hopedale, Ill.
Floyd Smart, 455 E. Division, Decatur, Ill.
Chas. G. Smith, Hoopeston, Ill.
D. Smith, 614 22nd St., Moline, Ill.
Ernest Smith, R. R. No. 2, Aurora, Ill.
Donald Smith, Gilman, Ill.
M. E. Smith, Mahomet, Ill.
Orville Smith, Greenville, Ill.
Willard Smith, Deland, Ill.
Sanford Smith, 614 22nd St., Moline, Ill.
Wm. M. Snider, R. R. No. 4, Earlville, Ill.
Ed Sohner, R. R. No. 8, Rockford, Ill.
Wm. C. Sommers, R. R. No. 2, Pekin, Ill.
A. J. Spaulding, R. R. No. 2, Ottawa, Ill.
A. Sporer, 1308 Madison St., Ottawa, Ill.
E. M. Stanton, 1030 Chas. St., Aurora, Ill.
R. C. Stambaugh, Astoria, Ill.
E. C. Standish, R. R. No. 3, Marengo, Ill.
Ulysses G. Stanley, Mountain View Apiary, Nisbet, Pa.
Thos. Stark, R. R. No. 2, Georgetown, Ill.
Geo. Stebbins, 90th Ave. and 123rd St., Palos Park, Ill.
James Steiner, Geneseo, Ill.
D. R. Stephens, 6613 Normal Blvd., Chicago, Ill.
Dr. H. S. Stimson, 6820 Windsor Ave., Berwyn, Ill.
Mrs. Leroy Stockdale, Palos Park, Ill.
Leroy Stockdale, R. R. No. 1, Palos Park, Ill.
Jas. A. Stone, Farmingdale, Ill.
O. L. Stone, 345 W. Cerro Gordo St., Decatur, Ill.
E. Stoneman, R. R. No. 2, Freeburg, Ill.
Geo. Strango, R. R. No. 1, Maple Park, Ill.
Rex Stricklin, 1207 Trolley St., Eldorado, Ill.
A. J. Street, Waggoner, Ill.
C. G. Strieder, Brinfield, Ill.
Floyd J. Strope, 301 Caroline, Pekin, Ill.
Mrs. Floyd J. Strope, 301 Caroline St., Pekin, Ill.
A. Studebaker, Seward, Ill.
W. H. Stumm, R. R. No. 3, Edinburg, Ill.
W. R. Suhre, R. R. No. 1, Hoopeston, Ill.
H. L. Summers, Gen. Del., Mt. Vernon, Ill.
Frank Supancic, 313 Smith St., Joliet, Ill.
Harry M. Sulzberger, Ransom, Ill.
F. L. Swanland, Dixon, Ill.
E. W. Switzer, Weldon, Ill.
Chris Tarran, Jr., Irving, Ill.
Hoyt Taylor, Pleasant Plains, Ill.
Alfred E. Thomas, R. R. No. 3, Roanoke, Ill.
Roy Thompson, R. R. No. 2, Sycamore, Ill.
Geo. Thomson, 336 Normal Pkwy., Chicago, Ill.
Ralph Tienstra, Homewood, Ill.
L. Toepke, R. R. No. 5, Bloomington, Ill.
John Tomastic, 1302 Woodruff Rd., Joliet, Ill.
Sam E. Totel, R. R. No. 2, Ottawa, Ill.
S. W. Travis, 804 Locust St., Litchfield, Ill.
O. A. Tryon, 6530 Oliphant Ave., Chicago, Ill.
Carl H. Tudor, R. R. No. 2, Sycamore, Ill.
N. M. Turner, R. R. No. 4, Edgemont Station, East St. Louis, Ill.
B. A. Tyler, Mt. Pulaski, Ill.
S. A. Tyler, San Jose, Ill.
John Urda, Panama, Ill.
Archie V. Utt, Oak Lawn, Ill.
W. H. Valentine, Mackinaw, Ill.
Chas. Valerius, Elkville, Ill.
Ed Van DeVorde, Atkinson, Ill.
Louie Vannis, Harrisburg, Ill.
Mrs. Filomene Vasumpaur, R. R. No. 2, Spring Rd., Hinsdale, Ill.
Fred Vogel, R. R. No. 1, Millstadt, Ill.
Irwin Vogel, R. R. No. 1, Millstadt, Ill.
Wm. H. Voight, Monee, Ill.
John Voorhees, Eureka, Ill.
Peter Vree, 229 W. 11th Pl., Chicago, Ill.
Clarence Wager, Genoa, Ill.
L. F. Wagner, Millstadt, Ill.
Edwin Walen, R. R. No. 1, Ransom, Ill.
Wm. J. Wall, Windsor, Ill.
Lee Waller, Durand, Ill.
Wm. Wallanches, 2715 Dunham Rd., Downers Grove, Ill.
John D. Walter, R. R. 1, Box 56, Congerville, Ill.
Rev. Geo. A. Walters, Ashton, Ill.
Emory Warner, Monticello, Ill.

Raymond Weaver, R. R. 3, Pittsfield, Ill.
Geo. H. Weed, Lanark, Ill.
Lawrence M. Weiss, R. R. 1, Taylor Ridge, Ill.
Albert C. Welge, Butler, Ill.
B. Welliever, 1764 N. 42nd St., E. St. Louis, Ill.
Theo. Wellner, 109 Walsh St., Joliet, Ill.
H. P. Westerman, Oreana, Ill.
Joseph Westlake, Elburn, Ill.
Wesley Jackson, Leroy, Ill.
B. F. Wheeler, Milan, Ill.
Frank A. Whelan, 7402 Stewart Ave., Chicago, Ill.
Milton Whiteford, Manito, Ill.
Ivan Whiting, Roscoe, Ill.
Hal Whitlock, R. R. 1, Eldorado, Ill.
H. A. Wickersham, E. Moline, Ill.
F. A. Wicklein, Percy, Ill.
Daniel Widicus, St. Jacob, Ill.
Earnest Wikowsky, Cisco, Ill.
Clyde Wilde, Oregon, Ill.
LeRoy Wilkins, Cropsey, Ill.
Frank Wilner, 1020 E. LaFayette Ave., Jacksonville, Ill.
H. W. Wilson, Smyth St., Eldorado, Ill.
W. L. Wimberly, Texico, Ill.
Edward Winkler, 925 Plainfield Ave., Joliet, Ill.
Mrs. Edw. Winkler, R. R. 1, Joliet, Ill.
John Wiscorski, 912 Lincoln St., Waukegan, Ill.
Phobe Withrow, Geneseo, Ill.
Ray Wood, R. R. No. 2, Taylor Ridge, Ill.
J. R. Wooldridge, 2021 W. 70th St., Chicago, Ill.
S. W. Wrigley, 123 W. Walnut St., Sycamore, Ill.
Christian J. Wuetig, 2609 W. Vermont St., Blue Island, Ill.
E. C. Wyne, Hammond, Ill.
W. C. Young, 8514 S. Elizabeth St., Chicago, Ill.
Frank Zadel, Witt, Ill.
Theo. Zarnicki, R. R. 3, Belleville, Ill.
Warren Zeigler, 1410 27th Ave., Moline.

THE LIBRARY OF THE
JUL 1 1935
UNIVERSITY OF ILLINOIS

INDEX.

PAGE

American Honey Institute....107–110
American Honey Institute Illinois Membership....111–112
Annual Report of the Chief Inspector of Apiaries for the Beekeeping Year Starting April 1, and ending October 20, 1934—C. L. Duax....97–107
Analysis of Twenty-five Illinois Honeys and the Quantitive Methods Used—G. E. Lynn, V. G. Milum, D. T. Englis (University of Illinois)..54–62
Attendance at Forty-fourth Annual Convention....33–34
Attendance at Forty-third Annual Convention....19–20
Charter Members.... 133
Code of Rules and Standards for Judging Bee and Honey Exhibits at Fairs as Adopted by Illinois State Beekeepers' Association....140–143
Constitution and By-Laws of the Illinois State Beekeepers' Association....131–132
County Association Activities for 1933 and 1934....83–94
Diseases of Adult Bees—V. G. Milum, B. D. Burkes....70–79
Honorary Members.... 133
Information About Bee Culture—U. S. Department of Agriculture....134–139
James A. Stone....26–27
Letter of Transmittal.... 3
List of Awards of the Illinois State Fair....123–129
Members of Illinois State Beekeepers' Association for 1933-1934....144–151
Minutes of the Forty-third Annual Convention....9–11
Minutes of the Forty-fourth Annual Convention....21–23
Officers of Illinois State Beekeepers' Association for 1933.... 6
Officers of Illinois State Beekeepers' Association for 1934.... 7
Officers of Illinois State Beekeepers' Association for 1935.... 8
Paper Given on Floor of the Convention—M. G. Dant....35–40
Pollination of Fruits—R. L. McMum....45–53
Report of the Treasurer for 1933....13–15
Report of the Treasurer for 1934....28–29
Report of the Secretary for 1933 and 1934....31–33
Report of the Advertising Committee....113–114
Resolution Adopted at the Forty-third Annual Convention.... 12
Resolutions Adopted at the Forty-fourth Annual Convention....24–25
2,000 Mile Beekeeping Tour—Wesley W. Osborn....41–44
State Inspector of Apiaries....95–96
The Effect of Methods of Processing, Heating and Storage Temperature of the Crystallization of Illinois Honeys—V. G. Milum, G. E. Lynn, K. T. Crum, (University of Illinois)....63–69
Winning Recipes in Honey Culinary at the 1934 State Fair....115–121
Winning Recipes of the Pleasant Plains Farmers' Institute....122–123

UNIVERSITY OF ILLINOIS-URBANA
3 0112 048212010